MAY, 1957

TRAFFIC ENGINEERING

- Renewing Cities for the Auto Age
- Status of Traffic Engineering Education
- An Evaluation of the Traffic Problem
- Vehicles vs. Vessels at Drawbridges

INSTITUTE OF TRAFFIC ENGINEERS
ITE
FOUNDED 1930

Brighten the Stripe for Safety . . .
with CATAPHOTE REFLECTIVE TRAFFIC BEADS

Moments ago this scene lay shrouded in shadow. Then . . . out of the night comes brilliance . . . to serve the cause of safety.

Approaching headlamps spill their light upon the roadway and distant pavement markings leap from the darkness . . . as if by magic. No witchcraft, this . . . but the man-made magic of Cataphote Reflective Traffic Beads.

Manufactured from high-grade optical crown glass, Cataphote beads are highly resistant to traffic wear and the effects of weathering. Easily applied by a bead dispenser on any standard striping machine, they provide immediate reflectance and lower paint drying time. Available plain, or waterproofed for all-weather visibility.

Let the man-made magic of Cataphote Reflective Traffic Beads add nighttime visibility to your traffic markings. You'll be rewarded with increased safety, improved channeling of traffic and markings that will outlast plain stripes by 50%.

Remember . . . *any stripe worth laying is worth reflectorizing . . . by Cataphote* . . . manufacturers of a full line of non-electric traffic control products, all backed by nearly 30 years of specialized experience and research.

Cataphote
CORPORATION

TOLEDO 10, OHIO
JACKSON, MISSISSIPPI

City of Denver installs new P&K aluminum signal supports to help move increased traffic

Expanding industrialization and increased population has necessitated a new traffic signal program to keep traffic moving through the city. When completed, Denver will have a control system capable of safely handling today's traffic . . . *as well as tomorrow's.* Denver is planning ahead!

Modern lighting and vertical "over-the-road" signals are supported by new P & K aluminum shaft extensions and truss mast arms.

The use of these new P & K designs results in high signal visibility even against neon-lighted backgrounds and in congested areas. Great strength, easy installation and no painting or maintenance problems make these P & K units low in *real* cost.

THE P & K CATALOG TE-1 IS HELPING MANY MUNICIPALITIES NOW PLANNING TRAFFIC CONTROL MODERNIZATION. Write for your copy . . . and use the P & K planning and advisory services without obligation.

DISTRIBUTED BY LEADING TRAFFIC SPECIALISTS THROUGHOUT THE NATION

P&K PFAFF & KENDALL

84 FOUNDRY ST., NEWARK 5, N. J.

Take Your Pick...They're All Good In

THE AUTOMATIC

PARK-O-METER

TIME LIMITS

PARKING FEES

ALL COMMON COINS,

OPTIONAL COIN FEATURE

SPLIT-RATE FEATURE

Compare Before You Buy

Magee-Hale **PARK-O-METER COMPANY**

3909 Willow Springs Road
Oklahoma City 12, Oklahoma

TRAFFIC ENGINEERING

OFFICIAL PUBLICATION OF THE INSTITUTE OF TRAFFIC ENGINEERS

Vol. 27 MAY, 1957 Number 8

INSTITUTE OF TRAFFIC ENGINEERS

J. CARL McMONAGLE
President

JOSEPH E. HAVENNER
Vice-President

MATTHEW C. SIELSKI
Vice-President

EDWARD G. WETZEL
Secretary-Treasurer

DIRECTORS

ROBERT A. BURCH
District Number 5

GEORGE J. FISHER
District Number 4

GORDON K. GRAVELLE
District Number 2

HERBERT C. HIGGINS
District Number 6

GEORGE W. HOWIE
District Number 3

FRED W. HURD
District Number 1

CHARLES W. PRISK
Immediate Past President

PUBLICATION STAFF

DAVID M. BALDWIN
Editor

G. A. BACCHUS
J. W. CHAMBLISS
C. C. CLARK
WM. E. CORGILL
R. E. DUNN
M. J. HUBER
WM. L. MARVIN
E. A. MUELLER
C. C. ROBINSON
S. T. SIEGEL
BURT WHEDON
Associate Editors

PRESS OF INTERSTATE PLAINFIELD, N. J.

CONTENTS

FEATURES

Renewing Cities for the Automobile Age 357
Victor Gruen

Status of Traffic Engineering Education 360
Adolph D. May, Jr.

An Evaluation of the Traffic Problem and its Future 364
Work-Conference Report

Vehicles vs. Vessels at Drawbridges—A Case Study 367
David K. Witheford

NEWS

Traffic News 370
New Appointments 374
New Publications 376
Strictly Business 378
Coming Events 382

INSTITUTE AFFAIRS

Secretary's Column 382
Section News 383
Yearbook Changes 388
Membership Applications 390

MISCELLANEOUS

Reference Notes 393
Letters to the Editor 395
Professional Service Directory ..... 396 & 397
Index to Advertisers 396
Positions Available 396

COVER PHOTO:
Morning rush-hour traffic at Quaker Lane and the Shirley Highway approaching Washington through Arlington County and Alexandria, Virginia. The two-lanes of the Shirley and the ramp are combining to put 3400 vehicles per hour into the scene of this photograph.
U. S. Army photo, from helicopter hovering over the median.

TRAFFIC ENGINEERING is published monthly by the Institute of Traffic Engineers. Editorial offices are at 2029 K Street NW, Washington 6, D.C. Advertising plates should be sent to Interstate Printing Corp., 400 Watchung Avenue, Plainfield, N. J. For advertising information other than California, address Traffic Engineering, P. O. Box 1015, Plainfield, N. J. For California information, address Jess M. Laughlin Co., 3757 Wilshire Blvd., Los Angeles 5, Calif.

Entered as second-class matter November 7, 1941, at the Post Office at Plainfield, New Jersey, under Act of March 3, 1879. ¶Single copies 40 cents, subscription price $3.50 per year in the United States; $4.75 per year to foreign countries.

The Institute is not responsible for any statements made or opinions expressed in its publications. Publication of advertising does not constitute Institute approval or endorsement of the products or services advertised. Permission to reprint contents with customary credit line is given unless otherwise stated.

SAVINGS IN TIME MONEY • LABOR •

INSURED*

with

FLEX-O-LITE

TRADE MARK REG. U.S. PAT. OFF.

FREE FLOWING GLASS BEADS

Solve your reflectorizing problems with new Flex-O-Lite Free Flow Glass Beads. Proof of their superior qualities is evidenced by consistent use in several states and in many cities throughout the nation. A trial order will convince you of their high quality . . . superiority born of the "know how" and facilities of the country's dominant producer of reflective glass beads.

●

New Flex-O-Lite "Free Flowing" Bead Dispenser

Field tested for two years with over 600,000 lbs. of beads. Works equally well with standard type "A" beads, "Free Flow" beads or moisture-resistant type "C" beads. A positive action, precision-built bead dispenser for municipal and highway use. Rugged cast aluminum construction. Completely automatic or may be manually operated.

* The result of five years of research and development. Field tested for two years with the cooperation of highway and traffic engineers . . . your assurance of satisfaction.

LOOK AT THESE OUTSTANDING FEATURES:

1. Marked resistance to high humidity
2. Flow freely through dispensing equipment
3. Store for unlimited periods without agglomerating
4. Contain no injurious waxes, oils, resins or silicones
5. Offer perfect adhesion to any suitable traffic bead binder

SEND FOR FREE LITERATURE . . .
Use Handy Coupon Below

FLEX-O-LITE
MANUFACTURING CORPORATION

FLEX-O-LITE

TRADE MARK REG. U.S. PAT. OFF.

8301 FLEX-O-LITE DRIVE • P. O. BOX 3066 (AFFTON BR.)
ST. LOUIS 23, MISSOURI

DEPT. 3

Flex-O-Lite Mfg. Corp., 8301 Flex-O-Lite Drive,
P. O. Box 3066 (Affton Br.), St. Louis 23, Missouri

☐ Send complete information on your new Free Flowing Reflective Glass Beads and Free Flowing Bead Dispenser.

*Name*_____

*Street Address*_____

*City*_____ *Zone*____ *State*_____

Frankly Speaking . . .

COLORED REFLECTORIZED SIGNS have been under study for some time by one of the technical committees of the Institute. This committee (7B in Institute nomenclature) early decided that it would be valuable to obtain currently available information from states now using such signs and to collect as much opinion evidence as possible from those who had been able to observe such signs in actual use.

In an effort to carry out these objectives, a questionnaire survey was conducted among the 48 states and several special highway authorities. The results were of interest to the committee, and it is believed that they will be of similar interest to traffic engineers in general.

Twelve states reported substantial use of the signs now. Most of these states reported that the recognition value of the colored sign had been the deciding factor in a decision to use the colored background.

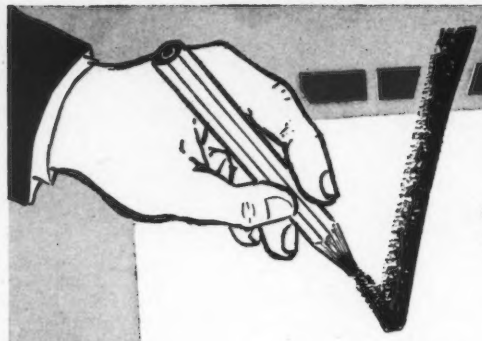
Fifteen of the remaining states not now using such signs to any great extent reported plans to expand their use of colored signs. Most of them reported that they had seen such signs in other states and had been favorably impressed. Many cited the separation of sign types by *color* as well as by *shape* as an appealing concept.

Public reaction as well as that of engineers and officials was reported as good in a majority of cases.

All of these comments have been noted by the committee as a guide to future work, which will include field studies. No opinions have been expressed yet as to the desirability of colored signs, least of all as to any specific color. Yellow and red have been preempted, of course, by the warning series and the stop sign, but the other colors of the rainbow are apparently available for possible use in other types of signs. All of this is work ahead for the committee.

The committee, which is currently under the chairmanship of Allan Pepper of Colorado, would welcome any contributions in the form of research or other helps that would enable it to reach sound conclusions as to the value of colored signs and specifications for such signs.

ROBERT A. BURCH
Director, District 4
Institute of Traffic Engineers



For SAFETY, DIRECTION and PARKING

Your Check Sheet for AIDS to BEST TRAFFIC CONTROL

NEFSLABS®

TRAFFIC MARKERS STRIPS ARROWS

☐ Toughest, flexible plastic. ☐ Reflective and non-reflective.
☐ Resist abrasion and tearing. ☐ Repel water, oils, salt.
☐ 5 brilliant, durable colors. ☐ 4 different shapes – also strip.
☐ 15 sizes and 2 thicknesses. ☐ Bevelled edges.

NEFMATS*

NEW DELUXE TRAFFIC LETTERS

☐ One piece, roll-down letter mats. ☐ Same "Traffic-Tested" plastic as NEFSLABS. ☐ 6 high contrast color-code combinations. ☐ Letters 1 to 10 feet high. ☐ No cutting, piecing or fitting.

*TRADE MARK APPLIED FOR

STOP

★**NEFSLABS** and **NEFMATS** give you the most **complete** line of plastic markings, letters, numerals and arrows. ★The very **highest** quality and **longest** life of any traffic marking materials mean **year-after-year** safety and savings for all uses. ★These aids to modern traffic control go down in **minutes** and stay down for **years** with special formula **NEFGLU.** ★**Proven** best by traffic test!

Write now for colorful NEFSLABS and NEFMATS literature

NEFGLU®

ADHESIVE

☐ Cold, quick drying. ☐ Strongest all-weather bonding. ☐ Light, neutral color. ☐ Easily applied by brush or pressure spray. ☐ No pegging or grouting.

New Sales Territories are Open for Capable Representatives.

J.W. NEFF LABORATORIES, INC.

TRAFFIC MARKINGS DIVISION

STOCKERTOWN 19, PA.

In Canada: 465 St. John St., Suite 2B, Montreal 1, Quebec

Renewing Cities for the Automobile Age

by Victor Gruen
Architect, A.I.A.

THE AUTOMOBILE is the one single factor which has contributed to the deterioration of our urban environment more than all others together. If the deterioration is to be stopped, we obviously must take the automobile into serious consideration.

The anarchy besetting our urban areas does not befuddle only us drivers and potential victims of the automobile, but also the makers of these instruments for traffic congestion.

Car designers employ the methods of the escapist entertainment industry out of necessity; because urban conditions do not permit us to drive fast, designers try at least to give us the visual illusion of "flight-swept" "Supersonic" "jet-liner" speed.

Once planners do succeed in bringing order into the urban chaos, needs for the development of many purposefully different types of cars—from tiny daily commuters to comfortable pleasure and vacation cars—will be crystallized. Then the car designer and engineer will find worth-while challenges to his inventiveness and ingenuity, instead of being what he is today: the fashionable milliner—the Mr. John of the highways.

If we want to continue to live in urban areas and to ride in automobiles, if we want to continue to be urbanized and motorized, but if we want to avoid the prospect of being immobilized and dehumanized in the procedure, only imaginative and bold measures will help. The present existing pattern of our urban areas is completely and utterly unsuited for the automobile age.

The main threads of this pattern are the streets, roads and highways which for the most part in gridiron fashion cover the urban scene—an urban scene which is spreading over steadily growing stretches of the nation, converting cityscape and landscape — into autoscape. These streets, roads and highways today have to fulfill a dual function. On the one hand they form the organizing lines along which all structures serving all types of pursuits are arranged: residences, stores, factories, office buildings, churches, and hot-dog stands. The second function which these streets, roads and highways are called on to fulfill is the one of carrying all motorized traffic, whether moving or parked: private cars, public transportation, trucks and trailers. The devilish thing is that the two uses are diametrically opposed to each other. The existence of motorized traffic between structures serving human activities renders these structures unlivable and unusable—the existence of solid lines of structures on both sides of the traffic right of ways renders them impassable. By this nightmarish arrangement, we succeed in killing or maiming a human being every six minutes; we slow a 300 HP "flight-swept" machine to a snail's pace; we shatter the nervous systems of pedestrian and motorist alike. This insane combination of two opposing functions is bound not only to make our cities unlivable but also to reduce and finally stop our mobility and kill the automobile industry in the process.

We are holding on to this schizophrenic double-existence of our roads in spite of the fact that we know better, and have in some instances, shown that we can do better. We know by now what the automobile really wants and what comes natural to it—many-laned, limited access, widely curved and easily graded freeways or expressways, with properly designed access and exit ramps. We also haven't quite forgotten, I hope, what the natural habitat of the human being is. Humans require, in order to be healthy of mind and spirit, a certain amount of exercise, which they can easiest get by using the two feet which are attached to their two legs, and by enjoying a certain amount of restfulness and quiet, including the possibility of looking around and observing things other than the red, green and yellow lights and the onrushing mechanized traffic.

If we remember the preferences of the two population groups which we have to consider (the human population and the automobile population) and if we further are willing to establish some kind of a priority system, giving the human population a slight break, we might have the key to the solution.

Let us create reservations for the human race and reservations for the automobile race and we will be able to achieve greater happiness and greater efficiency all around.

A new pattern emerges from this line of thinking. In it, the shape-creating force for the arrangement of structures is no longer the road grid. The formation of structures takes place instead in clusters around a new module: the human being. The string-like arrangement in which all elements of human activity cling to the automobile track disappears and is replaced with a pattern formed by clusters of structures of various types within contained shapes.

This is how the cluster system builds up:

One module equals one human.
A number of modules equal one family.
A number of families equal one group or social unit.
A number of groups form a community unit which, just like a single human being, has a heart offering social, cultural and economic facilities.

A number of such community units ring a grouping of clusters of a differ-

Figure 1
Northland Shopping Center, Detroit. This plan clearly applies the cluster concept by divorcing traffic areas from the pedestrian sections.

ent nature: a working nucleus for offices, laboratories, light industry; a trading nucleus for retail and services; a cultural, educational and recreational nucleus; or together, these form a large self-contained community.

These communities surround a town center which offers work, trade, entertainment, cultural and social facilities of greater size, depth and variety. Some such towns might be self-sufficient in the countryside, others would be part of a large metropolitan area. The metropolitan towns would be in the range of the magnetic field of a highly potent activity center—a main creator of urban energy, the metropolitan core.

This core fulfills the functions which we identify today with the downtown area. It is in itself subdivided into a group of nuclei (intimately connected with each other by pedestrian overpasses, moving sidewalks, and other devices) serving public administration, regional, statewide and national business, tourism and those cultural and recreational activities that can be supported only by very large numbers of people.

Each basic unit in this entire cluster system is sized in accordance to one measuring stick — this measure being the walking distance acceptable for its specific conditions and purposes, influenced by location, climate, and character of the unit. Each unit is held within a defined shape by its own centripetal force. Between each unit and its neighboring units, between each cluster and its neighboring clusters, and between each constellation of clusters and neighboring constellations, are areas free of structures — *the urban spaces.* They will have varying width, depending on characteristics of the land and the size of the units that they separate from one another. They will be utilized for agricultural, and recreational purposes, parks, orchards, playgrounds and so on.

Within these urban spaces will move all means of metropolitan transportation and communication. Fed from statewide or nationwide transportation arteries, there will branch off radial and peripheral lines of transportation and communication, such as railroads, rapid transit lines, trucking express roads, and up above, the rights of way of airlines. Each cluster, small or large, will be encircled by belt roads which will be connected with each other and with the central core. The roads will closely hug the various nuclei of human activities. In some cases underground facilities will reach underneath the cluster areas. In some cases loop roads will veer towards the middle of a nucleus. But, in no case will the means of transportation or communication cut through or enter into the "human reservations" on the surface.

Directly adjoining the loop roads, on the inside of the loop, will be storage areas for automobiles, varying in size and character, from one-level parking lots to multi-level electronically operated garages, and the terminals for public transportation. Service roads or conveyor belts will branch off from service truck lanes and be brought to points of destination underground. The surface area of the clusters themselves will be reserved for pedestrian traffic only.

To those who are doubtful about the practicability of the cluster concept,

Figure 2
The cluster pattern as proposed for downtown Fort Worth. The storage facilities are provided along the inner belt highway rim.

we can point to the existing examples of clusterization as we find them today. They all have in common the presence of the most important characteristics of the cluster concept.

The site plan of Northland Shopping Center, Detroit, clearly shows the belt highway and the car storage area adjoining it on the inside, and the pedestrian area, within the cluster itself.

The General Motors Research Center, designed by Eero Saarinen, follows basically the cluster concept, and so does the Santa Barbara College by Pereira & Luckman.

Now it might be claimed that all these examples deal with comparatively small units and that the application of the idea to larger units would be difficult. I do not believe that any restriction for the application of this system exists. Loop highways do not necessarily have to be a circle. They might take the form of a figure eight, or clover-leaf, with possible underground connections at the narrow portions of the loop.

You might also wonder whether the application of the cluster system would not necessitate wholesale destruction of our cities and building of new ones.

We have had the opportunity in studies for a number of downtown areas to prove that the system can be adapted to existing downtown areas. Most of you are probably familiar with the project of Fort Worth, Texas, in which we succeeded, by careful consideration of existing conditions, to avoid the demolition of any structures more than two stories high.

For the right of way of the belt highway, we used the blighted area which surrounds nearly every one of our downtown districts. We also placed the garages in areas where buildings of low value, parking lots, and used car lots were located. On this schematic plan you can also notice how the garages have been shaped and located in such manner that the distances from the city-side-pedestrian exits to the center point of the downtown area are effectively shortened.

This cluster system can be applied to a smaller community, for recently we prepared such a plan for the downtown area of Green Bay, Wisconsin, and these principles worked out very well.

There are a number of factors prevailing which constitute together a national emergency condition and which show dramatically the urgent need for an urban design philosophy. (1) The desperate economic situation of many of our downtown districts which bring about many poorly conceived unrelated actions, resulting in half measures and poor-risk financial investments. (2) The existence of the Federal Rehabilitation program which proceeds in most cases aimlessly because a tie-in with a general planning concept for the city or urban region is not established. (3) The impending implementation of the most massive public roads program this nation has ever known is without the existence of a basic planning philosophy. This tremendous effort might very well, in our urban areas, result in most serious damage.

Let me try to illustrate this last point. These new highways are being designed by highway engineers and traffic experts. Some of these are my good friends, and they are the first ones to admit that they are approaching the problem solely from the point

(Continued on page 363)

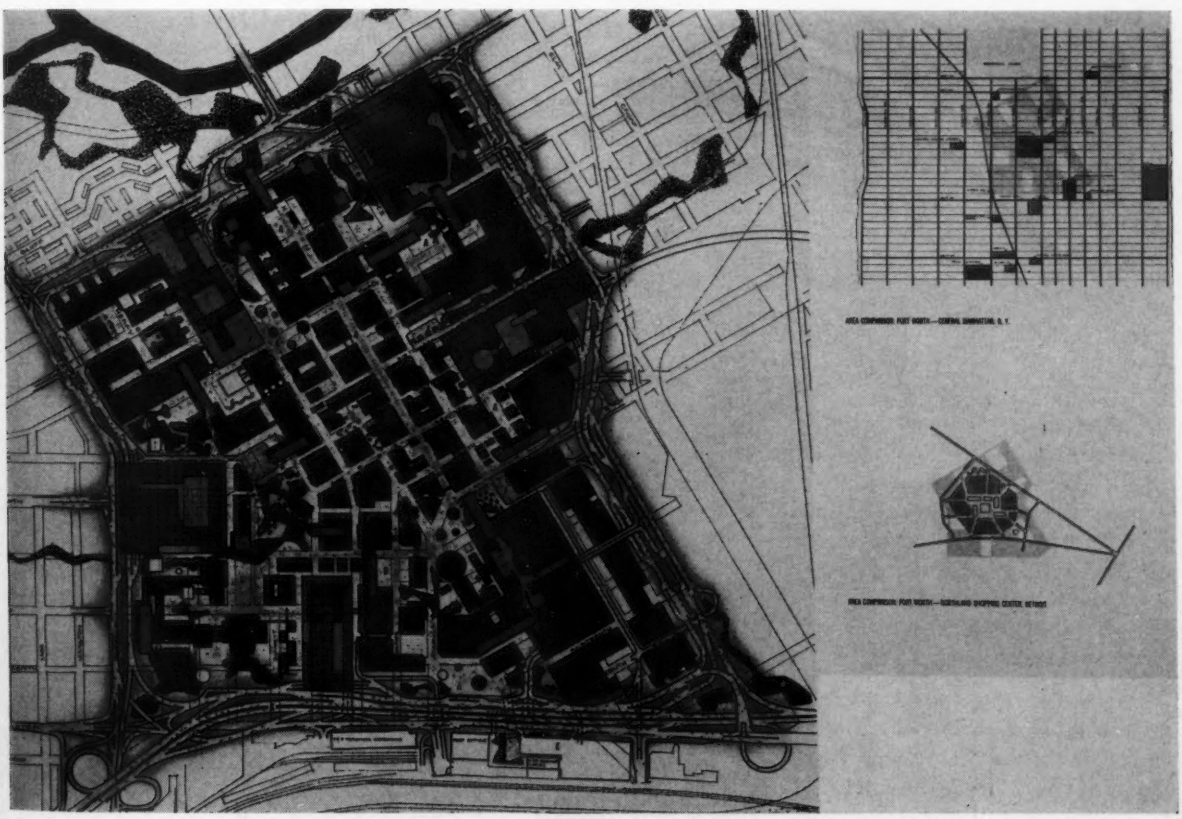


Figure 3

This illustrates the relatively short walking distance that will be provided by the Fort Worth Plan —not much greater than that found at Rockefeller Plaza, or at the Northland Shopping Center.

Status of Traffic Engineering Education

by Adolf D. May, Jr.
(Jun. Mem., ITE)
Civil Engineering Department and
Highway Traffic Safety Center,
Michigan State University

Introduction

Three important ingredients for highway transportation are money, materials, and men. With the advent of the recent federal aid to highways, more funds will be available to greatly expand our highway system, particularly the interstate system. The leaders of the highway materials organizations have assured the Government and the various highway departments that quantities of materials sufficient to handle the expanded highway program will be available. The major problem that we face is the lack of well-trained highway and traffic engineers.

Recognizing the serious deficiency in well-trained highway and traffic engineers and the lack of knowledge as to what colleges and universities are doing to prepare highway and traffic engineers, the staff of the Institute of Traffic Engineers began a study during the late summer of 1955. The project has continued under the guidance of Committee 2-C "Traffic Engineering Education."

A QUESTIONNAIRE WAS MAILED to each college and university in the United States which had an accredited Civil Engineering Department. The professor in charge of the traffic and highway courses was requested to complete the form and return it. Of the 127 accredited Civil Engineering Departments, 113 or 89 per cent returned the completed questionnaire.

In addition to an analysis of the completed questionnaires, study was made of recent publications of the American Society for Engineering Education. These publications provide information as to trends in civil engineering education and compare enrollments of the various engineering departments.

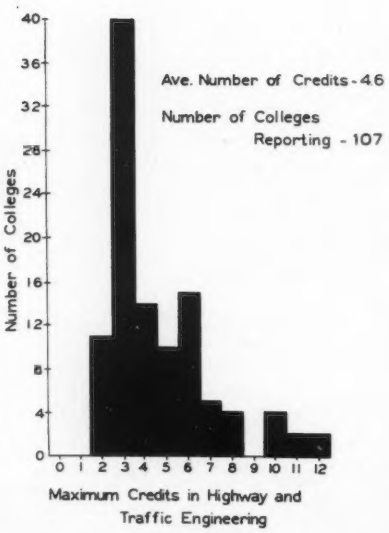

Ave. Number of Credits - 4.6
Number of Colleges Reporting - 107
Number of Colleges
0 4 8 12 16 20 24 28 32 36 40
0 1 2 3 4 5 6 7 8 9 10 11 12
Maximum Credits in Highway and Traffic Engineering

Figure 1
Distribution of Total Credits of Highway and Traffic Engineering Courses Offered at Various Colleges.

SURVEY RESULTS

Traffic Engineering Educators

Of the 113 colleges responding, there were 215 persons who taught a course or courses in highway or traffic engineering. This figure was much greater than originally estimated and it is surprising that of the 215 persons, only 29 or 14 per cent are members of the Institute of Traffic Engineers. Note however that the survey covered courses in both highway and traffic engineering.

Undergraduate Highway and Traffic Engineering Courses

The distribution of maximum credits available to the civil engineering student in highway and traffic engineering at the various colleges and universities is shown in Figure 1. Fifty-one of the 107 Civil Engineering Departments offer either a two or three credit-hour course in highway and traffic engineering. Eight universities offer more than nine hours of credit. The average number of credits was 4.6 while the median was between 3 and 4 credits.

More specifically in traffic engineering, the number of traffic engineering lectures given at the various colleges and universities is shown in Figure 2. Forty-two of the colleges give less than ten lectures in traffic engineering, while 5 give more than 61 lectures. The average number of lectures was 20 while the median was 14.

Thirteen Civil Engineering Departments offer an undergraduate course which is completely devoted to traffic engineering. During the academic year 1954-1955, 222 students took these traffic engineering courses. A list of the 13 departments giving this course is presented in Figure 3.

In order to obtain some indication of how many undergraduate civil engi-

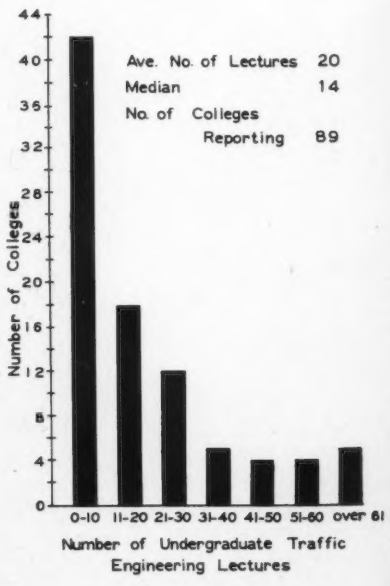

Ave. No. of Lectures 20
Median 14
No. of Colleges Reporting 89
Number of Colleges
0 4 8 12 16 20 24 28 32 36 40 44
0-10 11-20 21-30 31-40 41-50 51-60 over 61
Number of Undergraduate Traffic Engineering Lectures

Figure 2
Distribution of Traffic Engineering Lectures at Various Colleges and Universities.

College or University	Credits	Student Enrollment
1. University of California	3	18
2. University of Illinois	4	24
3. University of Kansas	2	10
4. Michigan State University	3	10
5. University of Michigan	4	20
6. University of Minnesota	2	10
7. Ohio State University	2	38
8. University of Oklahoma	3	15
9. Purdue University	5	20
10. Rensselaer Polytechnic Institute	3	10
11. Texas A & M College	3	20
12. University of Washington	2	18
13. Wayne University	2	9
		222

Figure 3
Universities Offering a Specific Undergraduate Course in Traffic Engineering.

1. University of Arizona
2. University of Arkansas
3. Brooklyn Polytechnic Institute
4. University of California
5. University of Colorado
6. Cornell University
7. Georgia Institute of Technology
8. University of Illinois
9. Iowa State College
10. University of Kansas
11. University of Kentucky
12. Massachusetts Institute of Technology
13. University of Massachusetts
14. Michigan State University
15. University of Michigan
16. University of Minnesota
17. Mississippi State
18. Missouri School of Mines
19. New York University
20. North Carolina State
21. Northwestern University
22. Ohio State
23. Oklahoma A & M
24. Princeton University
25. Purdue University
26. University of Southern California
27. Southern Methodist University
28. Stanford University
29. Texas A & M
30. University of Utah
31. Wayne University
32. University of Wisconsin
33. Yale University

Figure 4
Colleges and Universities Offering Graduate Courses which include Traffic Engineering.

neering students would select an elective course in highway or traffic engineering, an anlysis was made as to the number of students enrolled in required highway courses and in elective highway courses, of those colleges where highway electives were available. Of the 708 students taking the required course in highway engineering, 239 or 34 per cent took an elective course in highway or traffic engineering.

Graduate Highway and Traffic Engineering Courses

Thirty of the accredited Civil Engineering Departments reported that they taught one or more graduate highway engineering courses which included traffic engineering, and a list of these colleges and universities is given in Figure 4. As of the academic year 1954-1955 there were 294 students taking these graduate courses.

Traffic Engineering References

A portion of the questionnaire was devoted to determining if the magazine Traffic Engineering and the *Traffic Engineering Handbook* were available to civil engineering students. The results indicated that one-half of the colleges had at least one copy of each on the campus, while one-fourth had either one or the other, and the remaining one-fourth had neither the magazine nor the handbook.

SUMMARY OF ASEE ANNUAL REPORT

Engineering Enrollment

Each year there appears in the February issue of the *American Society for Engineering Education Journal*, statistics which indicate trends and comparisons between the various departments. Engineering enrollment from 1947 through 1955 for freshmen and upper classmen is shown in Figure 5. Engineering enrollment reached a low ebb in 1951 when there were 126,000 undergraduates enrolled. There has been a continued increase in engineering enrollment until in 1955 there were 190,000 undergraduates enrolled. The smallest freshmen engineering class was in 1950 when 28,000 enrolled but this increased to 60,000 by 1955. Engineering enrollment is apparently increasing at an average rate of 12 per cent per year.

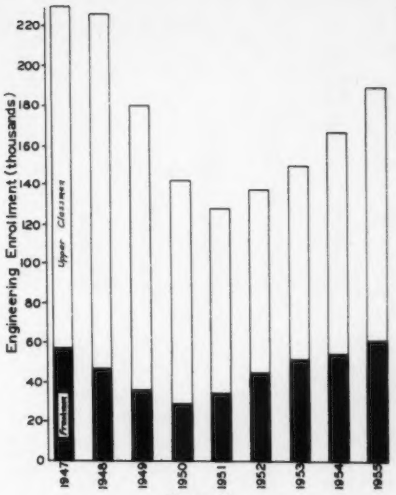


Figure 5
Freshmen and Total Engineering Enrollment 1947-1955.

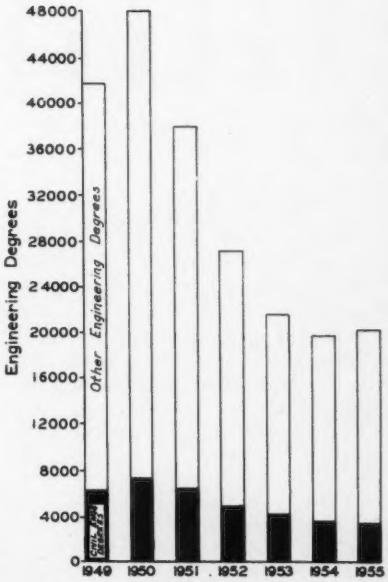


Figure 6
Civil Engineering and All Engineering Degrees 1949-1955.

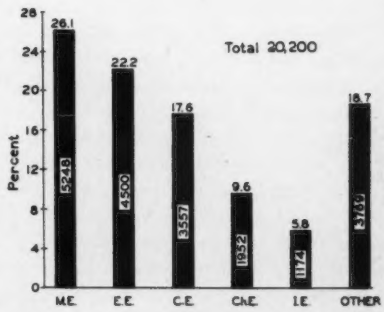


Figure 7
Distribution of Bachelor's Degree in Engineering by Departments in 1955.

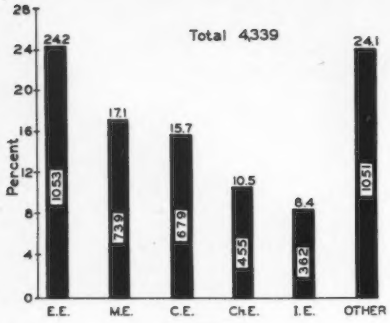


Figure 8
Distribution of Master's Degree in Engineering by Departments in 1955.

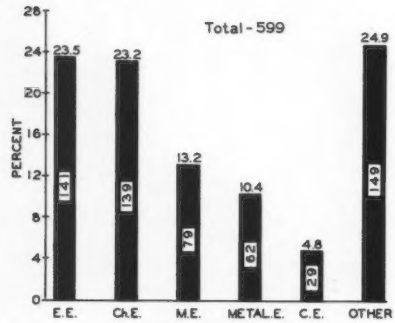


Figure 9
Distribution of Doctor's Degree in Engineering by Departments in 1955.

1. Brown University
2. University of Colorado
3. Cornell University
4. Dartmouth College
5. Harvard University
6. University of Louisville
7. University of Maine
8. University of Minnesota
9. North Carolina State College
10. Ohio State University
11. Pennsylvania State University
12. Rice Institute
13. Texas A & M
14. Villanova University
15. Washington State College
16. University of Washington
17. Wayne University
18. Yale University

Figure 10
Universities and Colleges with Five Year Undergraduate Program in Civil Engineering.

Engineering Degrees

The number of engineering degrees reached a peak in 1950 when 48,000 engineers were graduated as indicated by Figure 6. There followed a drastic decrease of engineering graduates until 1954 when only 19,800 were graduated. There was a slight increase in 1955 when 20,200 graduated. On the other hand the number of civil engineering graduates has continued to decrease from 1950 until in 1955 only 3,551 were awarded degrees in civil engineering.

Figure 7 compares the number of engineering graduates by departments for the year 1955. The Civil Engineering Department ranked third with 17.6 per cent of the total engineering graduates. Mechanical engineering and electrical engineering were first and second respectively with 26.1 per cent and 22.2 per cent.

Figure 8 compares the various engineering departments as to the number of master's degrees awarded in 1955. Civil engineering remained in third place but with a slight decrease to 15.7 per cent of all master's degrees in engineering. On the master's level electrical engineering and mechanical engineering were first and second respectively with 24.2 per cent and 17.1 per cent.

Figure 9 compares the various engineering departments on the basis of the number of doctor's degrees awarded in engineering in 1955. Civil engineering was in fifth place with only 29 or 4.8 per cent of the doctor's degrees in engineering. Electrical engineering (23.5 per cent), chemical engineering (23.2 per cent), mechanical engineering (13.2 per cent), and metallurgical engineering (10.4 per cent) gave more doctor's degrees. Most of the 29 doctor's degrees in civil engineering were in the structural field.

Five-Year Curriculum

In recent years there has been a trend toward expanding the undergraduate engineering program from four years to five years. Figure 10 lists the 18 universities and colleges which now have a five-year undergraduate curriculum in civil engineering.

Cooperative Programs

Another special arrangement at some colleges and universities is a cooperative program in civil engineering whereby an undergraduate upon graduation would have a four-year education and, in addition, about a year and a half on-the-job experience. A list of the ten universities and colleges with cooperative programs in civil engineering is shown in Figure 11.

THE PROBLEM

One of the greatest problems facing the colleges and universities in highway and traffic engineering, and one which affects the number of college-trained highway traffic engineers available for the expanded highway program, is that out of every 10,000 freshmen entering college, only two

1. University of Akron
2. University of Cincinnati
3. Detroit University
4. Drexel Institute of Technology
5. Fenn College
6. University of Florida
7. University of Maryland
8. Northeastern University
9. Northwestern University
10. Southern Methodist University

Figure 11
Universities and Colleges with Cooperative Program in Civil Engineering.

graduate with a bachelor's degree in civil engineering and choose traffic engineering as a profession. Figure 12 is a graphical presentation of what happens to 10,000 entering freshmen in regards to choosing traffic engineering.

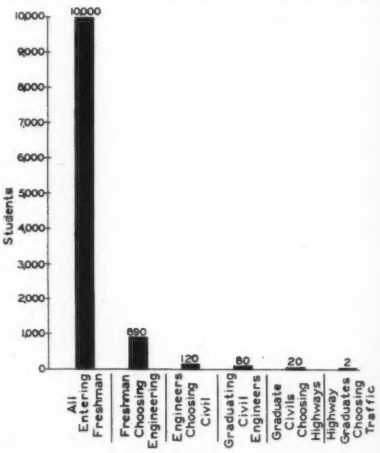


Figure 12
Estimated Civil Engineering Graduates Choosing Traffic Engineering Per 10,000 Entering Freshmen.

Of the 10,000 entering freshmen only 890 choose engineering. Of the 890 selecting engineering, 120 choose civil engineering. Of the 120 selecting civil engineering, 80 graduate. Of the 80 graduating civil engineers, approximately 20 select highway engineering, and of the 20 selecting highway engineering, only 2 or 3 go into the traffic engineering profession.

CONCLUSIONS

Members of the traffic engineering profession in cooperation with the colleges and universities can help meet this serious deficiency of trained highway and traffic engineers by:

(1) Encouraging high school graduates to consider highway and traffic engineering as a profession;
(2) Critically reviewing factors which may keep possible graduates from entering the traffic engineering profession;
(3) Developing a program whereby promising high school graduates

now employed in traffic engineering offices can work toward a degree in civil engineering or at least attend traffic engineering short courses and conferences; and

(4) Supporting civil engineering graduates who are now in the traffic engineering profession to do advanced work in highway and traffic engineering.

RENEWING CITIES

(Continued from page 359)

of view of traffic. "After all" they say, "we are not city planners." They usually react to the loudest raised complaint that our downtown areas are congested with traffic and that they should do something to get rid of the congestion. They conclude that they obviously have to reduce automobile traffic downtown and they achieve this reduction by building freeways, which either by-pass downtown in a broad arch, or traverse it as elevated or depressed roads. In each case they succeed in freeing downtown not only of the automobiles but also of the patrons who sit in those cars, thus pushing the urban core further towards the brink of economic disaster.

Their problem of course is a serious one. Let's take a look at it. An urban road system could be compared with a stream and its trubutary area. Water originating from an endless number of springs collects into brooks, which in turn, flow into rivulets and rivers until they all combine into the mighty stream. And the stream rolls freely through the land, terminating in a broad delta and into the ocean. The traffic stream has its springs in the scattered residences of the metropolitan area. They feed into brooks, or small roads, which in turn, combine into larger roads and highways, and finally into the freeway. The freeway, undisturbed by crossings, rolls all traffic towards the metropolitan core.

But here the comparison ends. There is no ocean provided for the stream to run into. Instead of that we expect the swollen traffic flood to suddenly disperse in tiny little dribbles through downtown streets. What happens is exactly what would happen to water behind a dam with only small holes pierced through it . . . the traffic backs up for miles along the freeway.

Noticing this the highway engineers propose to let the traffic stream roll on, either through the business core, as in Los Angeles or Boston, or somehow to one side of it. On the opposite edge of the urban area the traffic stream is then again divided into rivers and rivulets and brooks. Thus we create what nature has not succeeded in doing — a river with two beginnings, but no end.

This of course works in a fashion, and traffic flows. The only questions are WHERE TO and WHAT FOR? The freeway thus created establishes the best connection for people living in the northern suburbs and visiting friends in the southern fringe. The urban center is excluded from the pleasure of their visits and from receiving resulting economic benefits.

The cluster system permits us to overcome this problem. As in the Fort Worth Plan, the many laned belt highway becomes the collecting basin for the traffic streams and rivers from all sides, comparable (together with the storage facilities provided along its inner rim) to the collecting capacity of the ocean in Nature's system, and also making feasible the interchange from one of the radial freeways to another.

From my schematic description of the cluster system you will remember that similar belt highways would not only surround the metropolitan core area, but each of the constellations of clusters and each of the single clusters, and that urban open space would be provided between clusters and all groupings of clusters for all means of transportation. Now it seems obvious that if we could bring about agreement on this basic urban planning philosophy, we would be able to inform the traffic engineers and highway builders what we want to do, and where we want them to run their new freeways, instead of giving them, as we do now, misleading instructions. It seems obvious that with this basic planning philosophy in our minds we could prevent the waste of public monies for so-called improvements which are now often hurriedly and foolishly undertaken. We could stop the building of downtown garages and the widening of downtown streets—measures which not only are extremely costly, but also are destroying the most important asset of a good downtown area, its compactness resulting from the continuity of structures serving highly productive purposes. We could call a stop to all the activities which cut our urban areas into ribbons and disconnected fragments.

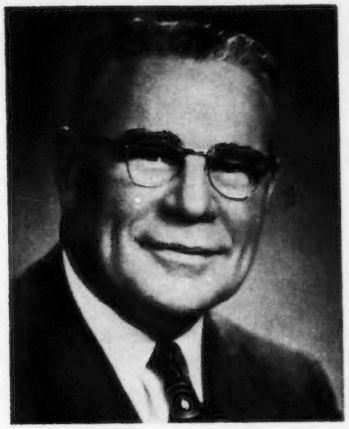
The cluster pattern theory and its most important ingredient — the complete divorcement of traffic-carrying thoroughfares from their function as organizing lines for building sites— seems to me the only presently existing planning philosophy which can give direction and provide guidance in the reorganization of our urban scene.

It applies equally well to new towns and cities as to existing ones. It provides a way, which in thousands of variations, can be applied to structure groupings serving residential, industrial, commercial, administrative, cultural, and recreational purposes.

It seems to me to be the instrument by which we can achieve the aim of being urbanites without losing mobility;

By which we can make our cities livable, efficient and also beautiful;

By which we can reinstate man as master — and our technological apparatus as a subservient tool.



Mathew J. Porosky

Mathew J. Porosky, 69, president and general manager of the Eagle Signal Corporation in Moline, Ill., died Sunday, March 3. His death followed by 15 hours the death of his wife.

Mr. Porosky came to Moline as executive vice-president of Eagle Signal in 1942 and became president and general manager a year later. Prior to that he had been a vice-president of Gamewell Elecric Co. of Boston.

He was an electrical engineering graduate of M.I.T., and was widely known in business and professional life in the Moline-Dapenport area as well as in Boston.

An Evaluation of the Traffic Problem and its Future

A Report of the
Pittsburgh Work-Conference
of the
Institute of Traffic Engineers

Foreword

The idea for holding a work-conference on the future traffic problem and its implications affecting traffic engineering evolved during a discussion of what is coming in highway transportation by several Institute members. They reached the conclusion that it was urgent that the traffic engineering profession appraise its present situation and anticipated future responsibilities. This procedure was considered a logical first step toward deciding upon actions which should be taken in order that the profession may fulfill the greatly broadened obligations which the future will inevitably impose, as traffic operations come to be more and more important in highway transportation.

The scope of the proposed work-conference was appropriately limited to the traffic operations viewpoint, with full recognition that similar analyses would be appropriate from the viewpoints of enforcement, education, and other professional areas.

From the outset, it was realized that the proposed work-conference would be only a start or a step toward the final objective of determining upon specific courses of action by the profession and then getting such actions implemented. As was to be expected, therefore, this report is in many ways incomplete, inconclusive, fragmentary, lacking in profound findings, even subject to question in parts.

Its value lies rather in the challenges which the careful reader will realize or sense, and in indicating the great need for further devlopment as to numerous matters set forth or indicated herein. If forward-looking further action is advanced by this report, the work-conference will have been worthwhile.

The Challenge

THE AMAZING GROWTH of motor vehicle registrations, changes in vehicle performance, growth of truck traffic, the marked trend toward urban living with resulting significant changes in cities—these and many other important developments mean that the American way of life is undergoing significant modification. Indications are that changes will continue rapidly in a dynamically developing America.

Major among the changes to come must be important ones in the field of highway transportation. Indeed the American way of life may properly be said to be "geared to highway transportation." Yet it seems evident that traffic growth will continue greatly to exceed increases in highway mileage, and probably to exceed rates of warranted improvement of highway facilities even for major traffic streams.

Consequently, it seems that increasingly greater emphasis must be given to getting maximum effectiveness in traffic operations. Therefore, engineers specializing in operations — that is, traffic engineers — face a tremendous challenge. Traffic engineering concepts, programs, techniques, understandings, skills, cooperation-abilities must broaden, develop, and grow to meet the needs of fast developing and changing conditions.

The Work-Conference was held at Pittsburgh, Pennsylvania, October 21 & 22, 1955. Participating were some forty past and current Institute officers and directors, together with a few invited guests. A full report of the meeting is available upon request from the Institute of Traffic Engineers.

The Forecast

1. By 1975, street and highway traffic in the United States will double in volume. This estimate was related to trends in population growth, number of households, and other factors, reasonable estimates of which were agreed to as follows:

ITEM	UNITS	1955	1975
Population	Millions	165	205
Households	Millions	48	60
Gross Natl. Prod.	Billions	391	720
Motor Vehicles	Millions	63	120
Veh. Miles	Billions	600	1300
Gas Consump.	Billions of Gallons	48	120

2. The next two decades will bring many changes in design of passenger cars, buses, trucks and truck combinations. The passenger car will not increase substantially in outside dimensions. In contrast, there will be longer and heavier truck combinations.

3. Although trends in all characteristics of vehicle performance are not clearly defined, it is generally agreed that there will be an increase in open road speeds. Questioned are continued power increases in the face of growing traffic volumes and mounting traffic density.

4. Uncertainty on vehicle performance developments and a feeling that manufacturers might be interested in experiences and views of traffic operations specialists suggests the establishment of better continuing interchange of information and better mutual understanding among those developing motor vehicles and highway facilities, and those dealing with operations and the human element (drivers and pedestrians).

5. The trend toward greater urbanization will continue.

6. Growth of suburban areas will continue at a faster rate than central city areas.

7. The central business district will

continue to be the hub of urban life, though there will be continuing adjustment in its functions and activities. It will remain the largest single generator of traffic though the number of persons making trips to the area may not increase materially in years to come. The future economic health of the central business district will depend considerably on improvements in transportation to the area. There must be a better public transportation thereto, and better parking facilities therein.

8. Public transportation is and will continue to be essential in all but quite small urban communities.

9. Expressways, with controlled access, are destined to be much more extensively developed in cities. These will be both radial and circumferential. In the planning and design of new highway facilities, every effort should be made to aid in the sound development of the downtown district. This means, for example, that adequate terminal facilities must be provided.

10. Redevelopment and renewal of the older sections of our cities will be extensive in the years ahead.

11. Suburban shopping centers will continue to develop. However, less of the mushrooming growth of the recent past is expected — instead suburban shopping center growth will more nearly parallel increases in population of the area from which each such center will attract customers.

12. In most cases, the destiny of well-located and planned outlying shopping areas will largely depend on their parking adequacy and ease of traffic access.

13. There will be considerable readjustment in many existing shopping areas. For example, some of the less attractive suburban shopping areas will return to a neighborhood shopping center status as a result of competition of newer and more attractive outlying shopping centers. Other outlying shopping areas may grow and provide more and more of the kinds of goods found in downtown districts.

14. The outstanding success of many outlying shopping centers and the competition between downtown department stores in establishing suburban branches may cause some overdevelopment of suburban shopping centers — with resulting financial difficulties, especially when major shopping centers are too close to each other.

The Impact on Traffic Engineering

The developments forecast for the years between now and 1975 will have major socio-economic effects on the entire country, of course. The impact on the traffic engineering profession, however, will be even more direct.

Of major concern to the profession, too, is some indication of what action is needed by the profession to best meet the needs. The following sections (each by a task group of the Work-Conference) attempt to summarize the situation.

I. Anticipated Changes in the Traffic Stream, and Resulting Operational Problems

Among physical changes anticipated during the next twenty years are greatly increased numbers of passenger cars, but, percentagewise, even greater increases in numbers of trucks, especially large truck combinations. The percentage of transit vehicles will decrease. Speed capabilities of vehicles will increase. Mechanical failures will decrease. Presumably the differences in acceleration and braking capabilities of motor vehicles, which importantly influence traffic operations, will be reduced.

Driver ability will improve through driver education, better driver licensing and other driver improvement programs.

Developments in automotive design and performance will present many problems for which answers must be found. For example, how will size, weight and maneuverability of vehicles in the traffic stream affect operating characteristics and hence street and highway design and operation? What will be the principal effects of changes in speeds, spacings, turning characteristics, accelerations, decelerations, stopping distances and the like on highway design and operation?

Answers to such questions must be obtained through expanded research, and the need for such research must be much more effectively advanced.

Such developments and changes together with highway improvements to high standards will create complex operational problems. In their solution, there will be need for better speed zoning, selective use of designated lanes for specific purposes or types of vehicles, possible regulation of traffic volume consistent with capacity of a facility, improved facilities for service to motorists especially on controlled access freeways (wreckers, ambulances, etc.), more and better facilities for relaxation adjacent to highways on long trips, improved electronic and other scientific methods for measuring and controlling traffic.

Ways must be developed to aid drivers in making satisfactory transitions between high and low type highways.

II. Future Urban and Metropolitan Patterns— Their Effects on Street and Highway Transportation

By 1975, while there will be many changes in urban and metropolitan patterns, it is not likely that many such changes will be startling or dramatic. Tomorrow's city pattern will not be altered extensively by civil defense considerations.

Urban evolution will be gradual, with some multi-level transportation facilities where justifiable, however, and supplementary facilities such as chutes, belts, small auxiliary vehicles.

Cities generally will become larger in both area and population, and there will be more political consolidation rather than formulation of increasing numbers of satellite communities.

Competitive merchandising will remain a major downtown function along with business offices, governmental, professional and other service agencies, and cultural and recreational activities. Suburban shopping areas will continue to grow but more slowly, paralleling increases in population served by these centers.

The rubber-tired, free-wheel vehicle will be the primary mode of transportation serving the city. Many more multi-car families will appear and people will always want to "go to town." Consequently, adequate and efficient highway facilities will be required, with increased emphasis on controlled access.

There will be increased use of air transportation, particularly vertical-lift types.

III. Future Role of Public Transportation

Public transit is now and will continue to be an essential part of street

transportation in all but very small urban areas. Yet increasing dispersion of employment centers and scattering of suburban residential developments greatly increase the problem of providing efficient public transportation. Public transit is most effective when it handles passengers between concentrated centers of human activity.

The future role of public transit depends on these factors: reduction in travel time, frequency of service, more attractive riding conditions, suitable transfer and terminal accommodations, and satisfactory adaptation of routes to travel needs.

To help improve transit service, future transportation planning should provide operational and terminal facilities for public transit wherever justified in connection with other highway projects. This planning should keep in mind the two principal functions of public transit: (1) express service between business districts and outlying areas, and (2) short hauls within the more densely developed areas.

Public transit is no longer a monopoly, for the automobile is a formidable competitor. Hence, since an economical, sound transit system is needed, regulatory bodies may well see the wisdom of relaxing outmoded requirements as to rates, routes, and schedules — thus helping to develop and maintain a healthy public transit system.

IV. Relationship Between Various Forms of Transportation Terminals

Future transportation needs will demand greater integration of all forms of transportation. Engineers concerned with streets and traffic should be alert to future trends and possible changes in other transportation fields, and to opportunities for coordination for more efficient operations. Such opportunities will of course occur most frequently in metropolitan areas where most transportation terminals are located and where concentrations of various types of transportation facilities are found.

As to rail transportation, consolidations can be anticipated in metropolitan areas, both as to tracks and passenger and freight terminals. All such developments will involve substantial highway transportation facilities, the operational aspects of which will be vitally important. Grade separation programs between railroads and highways will become imperative as traffic volumes increase.

Fast growing truck transportation will necessitate many traffic facilities and will provide opportunities for important coordination with rail, water and air terminals. Consolidated pick-up and delivery, off-street loading, and special truck routes will require new planning with great emphasis on operational aspects.

Intercity and suburban bus operations need study as to routings, bus stops, and terminals properly related to destinations and to other transportation facilities.

Air transportation—rapidly expanding, too—is producing increasing challenges to traffic engineering. Expeditious highway access to airports with suitable terminal facilities for highway vehicles must be developed if air travel is to provide its optimum benefits. Helicopter service, too, will gain increasing patronage.

In many areas, water transportation is destined to grow and change, with problems relating to interchange of goods between different forms of transportation on the one hand; and to problems of bridge clearances and bridge location on the other hand.

Furthermore, the future may well bring consolidations among transportation companies as well as new transportation ideas such as long-distance movement of truck-trailers by rail. All such developments will produce opportunities for service by an alert and prepared traffic engineering profession.

V. Zoning and Roadside Control

To adequately meet future traffic problems, zoning and other roadside control measures based on the general police power should be used more extensively.

Zoning, though of long-range value, can benefit highway transportation so greatly that the traffic engineering profession should give it increased attention. Highway zoning can limit locations of new commercial developments to selected commercial zones, and can control entrances and exits. In urban areas, zoning should be utilized to help meet future parking needs by requiring that new structures which attract much traffic provide off-street parking spaces in practicable proportion to traffic they will attract. Zoning should also include requirements for off-street loading, control driveway curb cuts, and protect reasonable sight distances at corners.

Parking and street patterns should be controlled in new residential developments by police power subdivision regulations.

Other roadside control measures are of great importance to traffic operations and should be given much more attention. These include acquisition of adequate rights-of-way, control of access, acquisition of special easements, and measures for designation and protection of future rights-of-way. Only through controlled access can the original capacity and effectiveness of a new artery be assured against injury from roadside developments.

The public and the legislatures must be brought to the understanding that two functions of main highways should be recognized and separately provided for: (1) express movement on lanes with controlled access, and (2) land service, through frontage roads and streets.

VI. Government Organization in Relation to the Traffic Problem

The function of the Federal Government in highway transportation will not be subject to major changes in the next twenty years.

At the state level, there are wide differences as to organization, administration and operation, some features being obsolete. Current state studies of basic laws relating to highway matters should produce modernization of great benefit to traffic operations. Traffic engineers should encourage such studies in their states.

In metropolitan areas, new organizational mechanisms are needed which will cut across political boundaries and produce (1) integration of main-highway transportation planning and financing, and (2) continuity and uniformity of operational policies and practices for metropolitan highway system — thus removing major obstacles which have so handicapped public officials.

Urgent need is seen for improvement of intergovernmental relationships, and more effective relations between units of the same government, be it city, county or state. Improvement will be greatly aided by clear definition of responsibilities and assignments of needed authority. Private citizens and organizations can help to obtain desired action.

(Continued on page 374)

Vehicles vs. Vessels at Drawbridges - A Case Study

by David K. Witheford
(Jun. Mem., ITE)
Assistant Traffic Engineer,
Delaware State Highway Department

THE CITY OF WILMINGTON, Delaware, situated midway between New York and Washington, has a population of approximately 200,000 in the metropolitan area. Bounded on the east by the Delaware River, the center of the City can be approached only from the north, west, and south. Highway traffic to and from the south, however, is confined to two drawbridges across the Christina River, a navigable stream flowing into the Delaware (see Figure 1).

Increasing conflict between the 50,000 vehicles using the drawbridges daily and vessels serving industries on the banks of the Christina created traffic congestion to the extent that relief measures became imperative. The need for modification of the navigational law which grants right-of-way to vessels was obvious and since such a modification required approval by the U. S. Government and the Secretary of the Army, a hearing with the Philadelphia District of the Corps of Engineers was scheduled.

The bridges in question are operated and maintained by the State Highway Department. Consequently the development of a report presenting the problem was assigned to the Traffic and Planning Division. It was felt that a complete investigation of river and highway traffic, including costs of delays, was needed to substantiate fully the State's request.

Since use of the river is essential to the industries along the banks, the only periods for which a restriction of bridge openings was requested were from 7:00-9:00 A.M. and from 4:30-6:30 P.M. on week days. These periods were selected as representing the daily peak hours for vehicles on Market Street and Third Sreet.

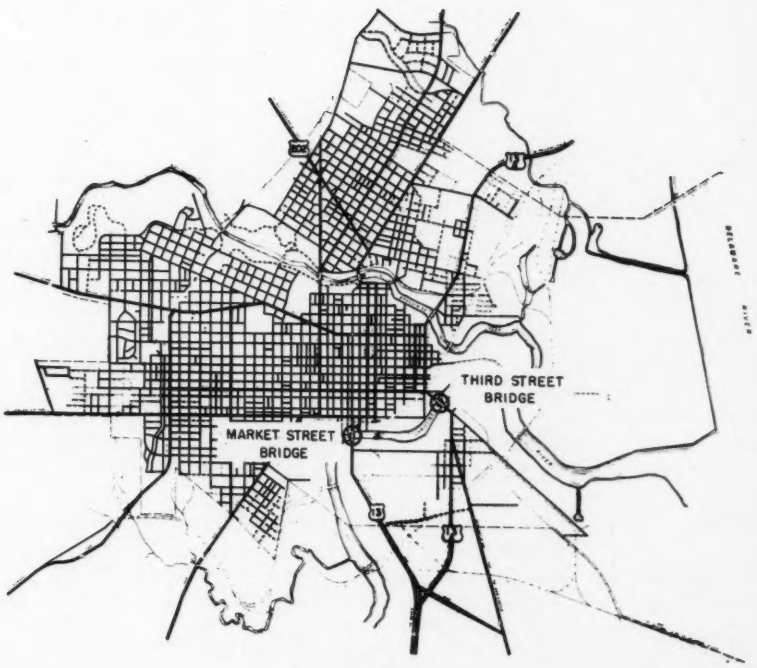


Figure 1
Map of Wilmington, Delaware.

Analysis of River Traffic

State Highway Department personnel at the Market Street and Third Street Bridges keep records of individual openings, including the duration of openings and vessels desiring passage. Consequently, information on river traffic was readily available.

The vessels using the Christina are principally tugs and barges, motor barges and other shallow draft vessels. Five of the ten destinations upstream from Third Street are gasoline and oil storage facilities, one is a sand and gravel plant, one is a shipbuilding firm and the remaining three are private or public docks. Three of these destinations are upstream from both bridges. The fact that six of the industries were bulk storage facilities was a convincing argument that the proposed restriction would not severely affect business operations depending on waterborne transportation.

A listing of bridge openings during peak hours in 1954-55 was prepared and is shown in Table I. More than 15 per cent of the openings at Third Street and 19 per cent of those at Market Street occurred during traffic peaks. The total number of openings at both bridges during 1955 was almost 3000. Third Street Bridge openings were found to average 5.5 minutes each, and Market Street Bridge averaged 6.2 minutes per opening.

A further investigation of shipping was also carried out in regard to the distribution of movements during 24 hour periods and according to tide conditions. Several months during 1954 and 1955 were selected at random, and graphs similar to Figure 2 were prepared. In addition to time of day and tide charts, this graph indicated type of vessel, whether only one or both bridges were opened, and the number

Table I
Listing of Bridge Openings, 1954-1955.

MONTHLY BRIDGE OPENINGS
AND PEAK - HOUR OPENINGS

1954

Month	THIRD STREET BRIDGE Total	Peak Hours	MARKET STREET BRIDGE Total	Peak Hours
Jan.	216	23	59	5
Feb.	173	37	56	13
Mar.	176	34	58	13
Apr.	142	13	42	3
May	147	20	36	5
June	188	23	50	2
July	151	21	48	12
Aug.	167	29	40	9
Sep.	184	27	41	11
Oct.	185	25	35	2
Nov.	163	23	32	2
Dec.	207	24	54	13
Total	2099	299	551	90

1955

Jan.	191	22	52	7
Feb.	162	19	64	7
Mar.	210	39	78	17
Apr.	178	26	55	10
May	176	29	42	4
June	147	33	46	13
July	144	15	59	12
Aug.	237	38	48	14
Sep.	207	25	37	10
Oct.	183	18	52	7
Nov.	219	42	48	12
Dec.	285	45	58	9
Total	2339	352	639	122

of openings during peak periods. A study of the graphs showed that shipping was almost evenly distributed through the day and night, and that tide conditions had only a slight influence on river movements.

Analysis of Highway Traffic

Traffic volumes and classifications were obtained from permanent counting stations in the vicinity as well as by special counts made at the bridges. The regular stations showed that on Market Street the 1955 ADT was 34,000 vehicles, 15 per cent of which were commercial vehicles and 28 per cent out-of-state vehicles. On Third Street, the 1955 ADT was 26,100 vehicles, 37 per cent of which were commercial, and 30 per cent out-of-state vehicles. These high percentages reflect the importance of U. S. Route 13 as the principal North-South interstate route on the west bank of the Delaware River.

Table II
Traffic Volumes at both Bridges.

PEAK HOUR TRAFFIC VOLUMES

	MARKET STREET	THIRD STREET
Daily Traffic	34000	26100
Peak Hours		
7 - 8 A.M.	2805	2135
8 - 9 A.M.	2040	1465
4:30 - 5:30 P.M.	2900	2250
5:30 - 6:30 P.M.	2640	2130
Total	10385	7980
Peak Hour Average	2600 per hr.	2000 per hr.

Peak hour counts were made at both bridges and traffic was classified as either passenger or commercial. The hourly volumes are recorded and listed in Table II. Fifteen minute counting periods were used throughout the four peak hours, and it was noted that in certain periods volumes attained equivalent rates over 50 per cent higher than the total hour counts.

For the purposes of developing delay costs, vehicle volumes were averaged over the four peak hours and factored from the raw counts to annual average peak hour figures. All told, the four hour period accounted for 30.5 per cent of the total average daily traffic.

Traffic Delay Costs

The average vehicle volume during peak hours and the average duration of openings being known, the number of vehicles encountering delay during an average bridge opening was determined from the formula:

$$n = \frac{v(B + 1.6)}{(3600 - 2.1v)}$$

where B = duration of opening in seconds
v = vehicles per hour per lane
n = vehicles delayed per lane

This derivation is found in "Traffic Performance at Urban Intersections" by Bruce D. Greenshields, D. Schapiro, and E. L. Ericksen, published in 1947 by the Yale Bureau of Highway Traffic.

The average time of delay per vehicle was then determined by the "Uniform Spacing Method" described in the same reference, which assumes that vehicles arrive at the point of delay in spacings of equal time intervals.

Unit operating costs to road users for "stops and starts," "standing," and time costs for passenger and commercial vehicles were assumed in accordance with AASHO recommendations. For each "stop and start," a figure of $0.005 per passenger vehicle was used. For each "standing" delay, $0.017 per passenger vehicle - minute was used. Time costs for passenger vehicles were assumed at $0.025 per vehicle-minute. In all cases, costs for commerical vehicles were three times these amounts.

Delay costs were calculated separately for each location, and it was found that the average cost per opening at Third Street was $45.43, compared with $74.19 for Market Street. Multiplying by the number of openings at each bridge, the direct delay cost to road users in the peak hours of 1955 was on the order of $25,000.

Intangible Factors

In addition to the direct costs, other costs were incurred which could not be specifically evaluated. Among these was the cost of stagnation in streets adjacent to the bridges. Vehicles backed up because of bridge openings invariably blocked major arterial streets in Wilmington. As a result, countless vehicles not being served by the bridges encountered the same delays. The total

cost to businesses because of the crippling effect of these bridges on employee and commercial transportation during peak hours was also impossible to evaluate. Finally the intangible but recognized factors of "comfort and convenience" were sacrificed during bridge openings. These considerations, added to the direct delay costs which can be estimated, were described with considerable detail in the report.

Additional Material Presented

The data outlined above was presented in report form at the hearing before the Corps of Engineers in March 1956 by Messrs. Richard A. Haber, Chief Engineer; William J. Miller, Jr., then Traffic and Planning Engineer, and Joe S. Robinson, Bridge Engineer.

A color motion picture, prepared by Mr. David A. McCue of the State Highway Department, and depicting the congestion at typical bridge openings, was shown in conjunction with the report. Letters from representatives of local governmental and private agencies supporting the Highway Department proposal were also submitted. Finally, additional testimony concerning the conditions was offered at the hearing by representatives of various agencies, including Mr. Robert A. Mitchell, Traffic Engineer of Wilmington.

Summary

The data presented in the report illustrated the economic costs, inconvenience, and congestion imposed not only on the 18,400 vehicles using the bridges during peak hours but also on the vehicles using adjacent streets. Testimony presented at the hearing by local government and private officials provided additional support for the State's contention that a periodic restriction of bridge openings was necessary. Investigation of vessel movements, into their number, nature, and scheduling, as well as a study of the industries served by the river, provided cogent arguments against the claims of the maritime interests who were expected to and did object to the proposed restriction.

Results of the Hearing

The data submitted by the State and others was forwarded to Washington after review by the Philadelphia District of the Corps of Engineers. On September 13, 1956, the approval of the Secretary of the Army was obtained. A public notice was then issued to the effect that ". . . the Third Street and the Market Street Bridges shall not be required to open for the passage of vessels between 7:00 A.M. and 8:00 A.M. and between 4:30 P.M. and 5:30 P.M., except on Sundays and Legal Holidays . . ."

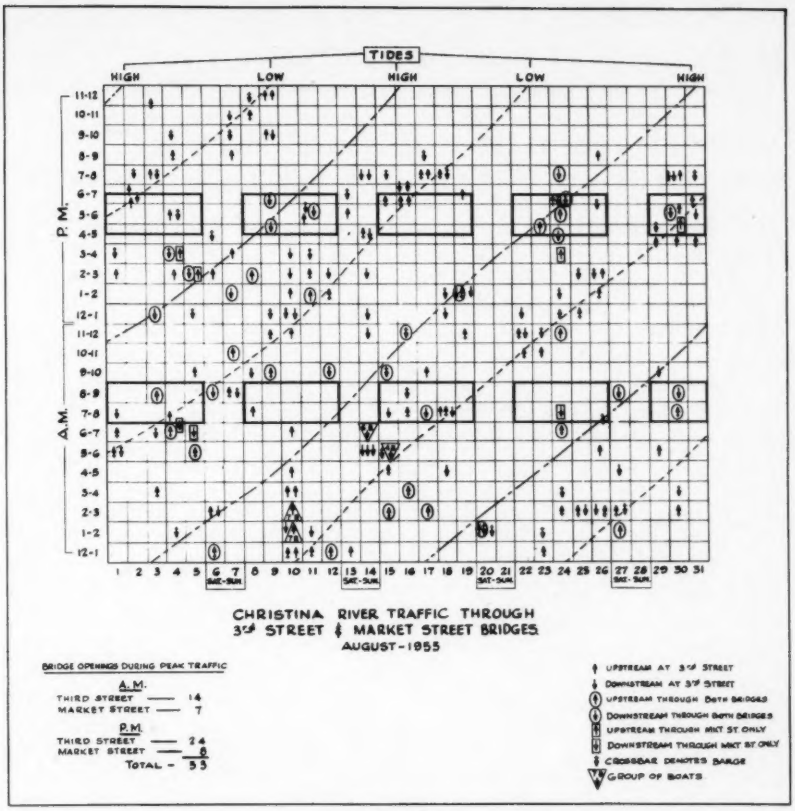


Figure 2
Graphic Representation of Bridge Openings.

While the original request had been reduced to only one hour in the morning and evening, the results were nonetheless gratifying.

The achievement of decreased congestion and economic savings to a sizeable and vital portion of Delaware's highway users was well worth the effort expended by the Highway Department in preparation of a factual and comprehensive report supporting its request.

Figure 3
Looking North to Market St. Bridge and Business District. Vehicles backed up at typical opening.

Traffic News

ITE AND AASHO SUBMIT STATEMENTS ON TRAFFIC SAFETY TO THE ROBERTS COMMITTEE

ITE Statement:

The Institute of Traffic Engineers wishes to emphasize three important beliefs which it feels are vital in the search for the key to success in all traffic safety efforts. These are:

1. A belief in the importance of and the need for more and better research in all areas;

2. A belief in the importance of a balanced program in applying the information we now have as well as in the application of new knowledge, skills and techniques developed by research; and

3. A belief that, while important and commendable, the Federal Highway Act of 1956 still leaves a great percentage of our highway facilities inadequate even for present needs.

As the Institute emphasized in an earlier written statement submitted to the Committee, more and better research is a paramount need. It is true that we know in general how to reduce accidents. We need now to sharpen our approach — to make our limited manpower the most effective weapon possible.

We need more accurate information about many specific problems. To mention a few areas, we need to know much more about the precise relationship of speed to accident occurrence, about the effect of motor vehicle condition, and about driver fatigue.

Several significant research programs are in progress, others are proposed. Worthy research should be encouraged and helped financially as much as possible. If any one thing were to be done in this area at the Federal level, the Institute suggests the stimulation of needed research, properly coordinated, through the release of Federal funds to the various operating agencies and to educational institutions anxious to help and capable of making major research contributions.

The Institute of Traffic Engineers believes that the traffic safety problem of this country will be solved only through the application of known techniques and new knowledge coordinated in a balanced program of engineering, education and enforcement.

The Institute holds that all fields of traffic administration must work together cooperatively in a balanced program — that each must strive for and attain its highest stature and efficiency. In engineering, the traffic engineer can make an important contribution.

The Institute believes—and we feel this concept is widely held—that traffic which moves smoothly and efficiently also moves more safely. We hold that measures taken to produce an even, regular flow of traffic without surprise, conflict or the need for sudden decisions on the part of drivers are generally the same measures which need to be taken for safety. Insofar as the traffic engineer contributes to efficient operation of our street and highway facilities, he also contributes to the safety of every user.

This close relationship between safety and efficiency of our highway transportation facilities has been recognized by Congress in enactment of the Federal Highway Act of 1956. This legislation has started the nation on its way to a superior system of interstate highways.

The relationship has also been recognized by those responsible for the development of design standards for these roads. Such improvements will become increasingly obvious to all users of the new highways. The 1956 act will thus be a major contribution to traffic safety.

A significant problem still confronts us, however, and attention to and interest in the 1956 act tends to overshadow its importance. We refer to the need for attention to the requirements of local highway facilities—city and county systems in particular. Local jurisdictions are, to a considerable extent, the "forgotten men" of this decade.

The new 41,000 mile interstate system to be built in the next 13 to 15 years actually will not serve much more than 20 per cent of our total traffic needs. This estimate includes the system's urban extensions.

The remaining 80 per cent of our traffic must be carried by existing streets and highways. This is despite the fact that about half of the new Federal-Aid money will be spent in urban areas.

Accordingly, we are confronted with a major, unsolved problem in which the Federal government will probably have to help if a solution is to be reached. One bold fact still remains with us — the streets and highways outside the interstate system are inadequate to carry present traffic loads — to say nothing of the greatly expanded demands that will be placed on them in the future.

The Institute of Traffic Engineers is of the firm opinion that needs must be faced squarely—not just in interstate transportation but in local transportation as well—if we are to realize the development of a truly efficient motor transportation system in this country. We hold that an efficient system at all levels will contribute tremendously to a new degree of safety for all highway users.

Accordingly, the Institute of Traffic Engineers believes in the need for:

1. New knowledge based on sound research;

2. Application of our traffic knowledge through a balanced program embracing maximum efforts in the areas of engineering, enforcement and education; and

3. A realistic view of the Federal Highway Act of 1956 along with the realization that all facilities must be improved.

AASHO Statement:

Gentlemen of the Subcommittee, my name is W. A. Bugge and I am Director of Highways for the State of Washington. I have the privilege of serving this year as President of the American Association of State Highway Officials and in presenting this Statement I am speaking for those organizations that build and operate the nation's roads that make up the several state highway systems, including roads built on the Federal-Aid systems and construction paid in part from Federal funds.

First, let me say that we are glad the Committee on Interstate and Foreign Commerce is continuing the Special Subcommittee on Traffic Safety. We pledge you the cooperation of the state highway departments. No group of persons is more conscientiously interested in reducing death, injury and

property damage on the highways than are the state highway officials. We are cooperating with the Bureau of Public Roads in supplying some of the data that is used by the Bureau in making the report on the subject of traffic safety that was requested by the Federal-Aid Highway Act of 1956.

We believe, and have been of that opinion for some time, that a desirable rate of progress in improving traffic safety is not being achieved by an emotional type of program. The program is far more basic and deep rooted and to improve our roads we must correct the basic faults.

Highways, because of the increased use of the motor vehicle, are becoming more and more complex in design in order to be safe and efficient. Rules of the road are many and complicated. We believe that the greatest strides in achieving traffic safety must be made in the field of "Education." We must thoroughly prepare the driver to cope with today's complex driving problems. He must be taught the limitations of the road, the driver and of the vehicle. He must be taught how to use today's complex highways. Education and the preparation of the driver to take over the operation of a motor vehicle must involve training far more extensive than is current practice today. In combination with this preliminary training, it is possible that potential drivers should be screened more thoroughly than now in extending the privilege of driving a motor vehicle on the public roads and streets. We put considerable effort into teaching the youth of the nation how to make a living and we are going to have to go to further lengths to teach them to survive in and to enjoy a motor age.

There is still progress to be made in the other two "E's" of traffic safety, namely "Enforcement" and "Education."

Highway officials have a big responsibility in the "Engineering" phase and there the responsibility is two-fold. First we must make existing highway facilities as safe as feasible and consistent with all economic and physical factors. Secondly we must construct new facilities to where they will be the safest possible under all conditions encountered.

The Interstate highway program is nationwide in extent and the state highway departments, in cooperation with the Bureau of Public Roads, have developed design standards which will give the safest type of highway facility that the highway engineer has yet been able to devise.

The main distinguishing feature that makes the proposed Interstate design so much different than the conventional type highways, as we know them today, is the principle of "controlled access." In some parts of the nation where traffic congestion has been critical for a longer period of time, controlled access has been used extensively and is enthusiastically endorsed by the public. In large areas of the United States traffic congestion has not been so critical up to the present time, and consequently there will be some opposition to the controlled access principle. There always is some opposition to new concepts in early stages. We can rest assured, however, that congestion on existing roads and streets will assume major proportions in all parts of the country before we complete the 13-year authorized program on the Interstate system. It would be poor judgment to contemplate building the vast Interstate network of the nation's most important transcontinental highways without using the controlled access application.

In the sparsely settled parts of the far west, however, some points of direct access will be permitted where the expense of separating grades or constructing long stretches of frontage roads would be the expensive alternate and the hazard to traffic will be comparatively small.

Control of access means a reduction in fatalities of two-thirds, a reduction of accidents of over two-thirds, and a retention of the design-capacity of the highway throughout the life expectancy of the facility. We feel that we cannot make too strong a statement on this one point for it affects traffic safety on these high traffic roads more than any other feature that can be applied.

The Committee will be interested to know that the Association has called upon the Highway Research Board of the National Academy of Science to undertake a detailed study of traffic accidents to determine the typical location and type of accident most frequently occurring and to make an expert appraisal of the cause. The Association then plans to convert this data into preventive geometric highway design. We realize that this project will take some time and is now only in the formative stage, but we are of the opinion that the final results are well worth the effort and any improvement in geometric design that might be developed will still be able to be incorporated in a great majority of the roads that will be built under the new Federal-Aid program. The highway departments realize that medicine made no rapid strides in curing the ailments of mankind until they determined what was causing the greatest number of fatalities or illnesses. It became necessary to make very extensive analyses, and in many cases autopsies, to determine the exact cause of death. After the cause was isolated then preventive medicine and surgery was developed. This is the line of thinking that has dictated the action outlined above taken by the Highway Officials in launching this important research project.

The Committee will also be interested to know that the Association is currently developing standard signs for use on the Interstate system of highways. It has been determined that high speed, high density, controlled access expressways require a different concept in signing than do conventional highways. Because of the high standards, a minimum of warning, caution and danger signs are needed. But the use and size of informational guide signs must be increased. It is very important that the driver be in the proper lane and be properly advised of his desired point of exit from the expressway. Advance advisory signs are needed and ones that will attract the attention of the driver who may have his reactions dulled somewhat by driving relatively long distances at comparatively high speeds. We believe the uniform use of such signs as we are developing will further enhance the safety features incorporated in the geometric design of the Interstate highway routes.

Control of Highway Access Receives Legislative Attention

Control-of-highway-access legislation is receiving attention this year in at least 18 states according to the National Highway Users Conference. The greatest activity is shown in bills to prohibit commercial service facilities from being located on the right-of-way of controlled-access highways and authorizing service roads to pri-

vate facilities. The Federal-Aid Highway Act of 1956 prohibits commercial establishments on the rights-of-way of the Interstate System.

Three states—Minnesota, New Mexico and North Carolina—are considering comprehensive controlled-access bills. The New Mexico bill has been approved by the legislature. These states do not presently have statutory authority to control highway access, although Minnesota and North Carolina are operating under favorable court decisions. Access law amendments are pending in California, Maine, Oregon, Pennsylvania and Texas. Statutory authority to control highway access is now effective in 43 states, while three states have favorable court decisions.

Legislation is pending in 11 states which would deny the use of controlled-access highway rights-of-way for the establishment of service facilities or other commercial facilities. These states are Colorado (passed House), Connecticut, Delaware, Maryland, Massachusetts, Nebraska, New Mexico (passed both Houses), New York, North Carolina, South Carolina (passed one House) and Tennessee (approved). These bills would further authorize the construction of service roads so as to facilitate the establishment of competitive private enterprises to serve the wants and needs of highway users.

A new Wyoming law restricts the use of ingress and egress roads to that designated by the State Highway Department and provides that in no event shall a private entrance or access to a controlled-access facility be used for any commercial enterprise. Massachusetts is the only state that operates commercial concessions on controlled-access rights-of-way and the pending bill would permit continued operation, but prohibit any further establishments. Additional Nebraska legislation would authorize the highway department to acquire property along access roads to the Interstate and other highways and then lease or sell to the highest bidders.

Several Federal bills have been introduced to control advertising signs along the marginal areas of the Interstate System. Hearings were held in March before the Senate Roads Subcommittee on this subject with many divergent views being stated. Secretary of Commerce Weeks went on record as favoring Federal control of advertising along the Interstate System.

Herbert J. Klar, Chief, Traffic Engineering Section, New Jersey Department of Law and Public Safety receives check for $100 and certificate, representing Eighth Annual Award for "Getting Results Through Traffic Engineering" from Robert J. Allen, (left) Assistant Manager, Accident Prevention Department, Association of Casualty and Surety Companies. Frederick J. Gassert, Director of Motor Vehicle Division, State of New Jersey, is at right.

Klar Wins 1956 Getting Results Contest

Herbert J. Klar (Assoc. Mem., ITE) has won top recognition in the 1956 "Getting Results Through Traffic Engineering" competition sponsored by the Association of Casualty & Surety Companies.

Klar, chief of the traffic engineering section of the New Jersey Department of Law and Public Safety, received a framed certificate and a cash award of $100. Changes which led to a 47 per cent reduction in accidents and the elimination of fatalities at a heavily traveled intersection in East Windsor, New Jersey, won this top honor for Klar. The solution to the problem was the addition of two traffic signal heads to provide additional opportunities for approaching drivers to observe the signal indications.

Major factors considered by the judges who picked the winning entry in the competition were effectiveness of the project in reducing accidents and congestion and the relationship of benefits to the cost of the improvements. Judges of the 1956 competition included William J. Miller, Jr., Deputy Chief Engineer of the Delaware State Highway Department, who represented the Institute of Traffic Engineers. Other judges were Thomas J. Seburn (Mem., ITE), Edward L. Smith (Jun. Mem., ITE), M. L. Shadburn and Ray Ashworth.

TRAFFIC ENGINEER WANTED

Near Los Angeles, California

CITY OF VERNON

Industrial City, Requires Competent

TRAFFIC ENGINEER

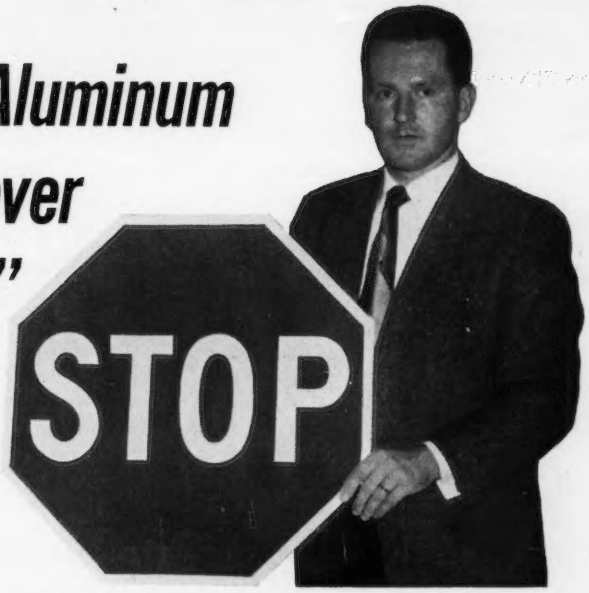
Only a man with years of experience solving difficult traffic congestion problems can be considered. This is a permanent position with top salary. Excellent working and living conditions.

Write in full. Enclose photo.

Wendell H. Kinney
410 Solano Avenue
Los Angeles 12, Calif.

"Here's how Kaiser Aluminum Sign Blanks save us over $10,000 every year!"

...says Dan Hanson,
Peoria's City Traffic Engineer



Lightweight and durable, signs of Kaiser Aluminum save on shipping, erection and handling costs—yet are strong enough to withstand 100 MPH winds. They won't rot or warp—stay rust-free even when damaged by accidents or vandalism. And as a base for paint and reflective sheeting they're unsurpassed.

"Before 1953 we had a real sign problem in Peoria. Constant replacement and maintenance demands kept four of our men on the go full time.

"But then we changed over to rustproof Kaiser Aluminum blanks. Now just two men can easily handle the installation of all new signs—and their minimum maintenance needs as well. So we're saving over $9,400 in wages *plus* $600 in truck expenses every year!

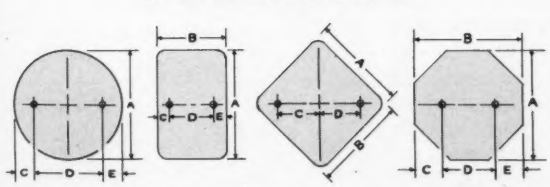
"And that's only the beginning. We can now anticipate a minimum of ten years' useful service with our new aluminum signs. That's over three times what we could figure on for steel. It's easy to see why switching to aluminum was one of the smartest moves we ever made!"

* * * * *

For the practical and economical answer to your costly maintenance problems, call your nearest Kaiser Aluminum sales office. Ask for our new booklet, "Kaiser Aluminum Highway Products." Kaiser Aluminum & Chemical Sales, Inc., *General Sales Office,* Palmolive Building, Chicago 11, Illinois; *Executive Office,* Kaiser Building, Oakland 12, California.

Kaiser Aluminum

KAISER ALUMINUM SIGN BLANKS ARE AVAILABLE IN THESE SHAPES AND SIZES



See "THE KAISER ALUMINUM HOUR." Alternate Tuesdays, NBC Network. Consult your local TV listing.

Type	SIZE Dim. A Inches	SIZE Dim. B Inches	HOLE LOCATION Dim. C Inches	HOLE LOCATION Dim. D Inches	HOLE LOCATION Dim. E Inches	BUREAU OF PUBLIC ROADS DESIGNATION NUMBER
A	24	24	3	18	3	KSR-201 (Kaiser Aluminum Designation)
A	30	30	3	24	3	R-1
B	24	24	12	12	—	W-1 to W-10 incl., W-13 to W-18 incl., W-22, W-23, W-25 to W-31 incl., W-34
B	30	30	12	12	—	W-19 to W-21 incl., W-24
B	36	36	18	18	—	KSW-202 (Kaiser Aluminum Designation)
C	40	24	3	18	3	R-37
C	40	20	4	12	4	W-11, W-12
C	36	12	1½	9	1½	R-16
C	24	30	3	24	3	R-13, R-29, R-30, R-102, R-104, R-105
C	24	24	3	18	3	R-15, M-101
C	24	19	1½	16	1½	R-103
C	24	18	2	14	2	M-4
C	24	16	2	12	2	M-103
C	24	9	1½	6	1½	M-20
*C	19½	15	1½	12	1½	M-107 to M-114 incl.
C	18	24	1½	21	1½	R-2, R-4 to R-9 incl., R-11, R-12, R-14, R-17, R-31, R-38
*C	18	14½	1¼	12	1¼	R-3
C	16½	8	1½	5	1½	M-3, M-15 to M-19 incl., M-21
*C	14	9	1½	6	1½	R-106 to R-109 incl.
*C	13	13	5½	6	1½	W-35
*C	13	10	1½	7	1½	M-7 to M-14 incl.
*C	12	18	1½	15	1½	R-10, R-15 to R-26 incl., R-32 to R-33 incl.
D	30	—	3	24	3	W-32
E	30	30	2	18	—	R-39

Alloy And Temper: 6061-T6. Mill Finish Or With Alodine 1200 Coating.
Gauge: .081". *Also Available In .064" Gauge.
Types B, C, & E Supplied With 1½" Radius Corners. All Mounting Holes Are ⅜" Diameter.

New Appointments

McDonald Joins Staff of Southern California Auto Club

John W. McDonald (Assoc. Mem., ITE) has been named to the position of Highway Engineer with the Automobile Club of Southern California. In his new work McDonald will be in charge of the Engineering Department and will report to Joseph E. Havenner, the Club's Director of Engineering and Technical Services and First Vice-President of the ITE.

John W. McDonald

McDonald's experience includes six years with the California Division of Highways and three years with the U. S. Bureau of Public Roads. His most recent assignment with the Division of Highways was that of Traffic Engineer for the Division's District Office in San Diego.

A graduate of Stanford University, McDonald received a master's degree in Civil Engineering Administration in 1948.

Sust Named to National Traffic Board in Cuba

Jose Sust (Assoc. Mem., ITE) has been named a member of the governing board of the Comisión Nacional de Tránsito of Cuba. This is the top authority on traffic matters in Cuba, and is presided over by the Minister of Transportation.

Also a member is Braulio Gonzales-Noro (Assoc. Mem., ITE), who serves as a delegate of the Minister of Public Works. With one other engineer, Sust and Gonzales-Noro represent the only engineering technicians on the ten-member board.

Sust is a civil engineer on the faculty of the University of Havana. Gonzales-Noro is chief engineer of the Havana City Planning Division.

AN EVALUATION

(Continued from page 366)

VII. Education and Training Necessary to Meet Future Traffic Problems

Recognizing needs, planning effective approaches and executing required activities to meet the traffic problems of the next 20 years will require a greatly expanded force of adequately-trained persons. The traffic engineering profession should help see that trained persons become available as needed.

More persons must be encouraged to take traffic engineering courses. Also, the concepts of traffic planning and operations need to be accepted as a necessary part of the education of all highway engineers. Educational concepts should be modernized in terms of anticipated problems of the next two decades. The engineering curriculum should be broadened to include adequate humanistic and social courses. Graduate programs should permit development of administrative and transportation planning ability. Such programs should utilize schools of public or business administration as well as schools of engineering. Broadened educational approaches should utilize contributions of other disciplines such as psychology, political science, philosophy, and law.

In-service training must, at the same time, be accelerated and improved, so that persons already in the field can keep abreast of expanding knowledge, opportunities and responsibilities.

The traffic engineering profession should assist in development of needed course outlines, teaching guides, text and reference materials, and teaching aids.

Meeting tomorrow's traffic problems will also require greatly expanded education and training in numerous other fields such as enforcement, driver licensing and accident analysis. Moreover, expected changes in the traffic stream will impose greatly increased responsibilities on drivers and pedestrians. Accordingly, there must be greatly expanded and improved driver education, driver licensing, and driver improvement programs.

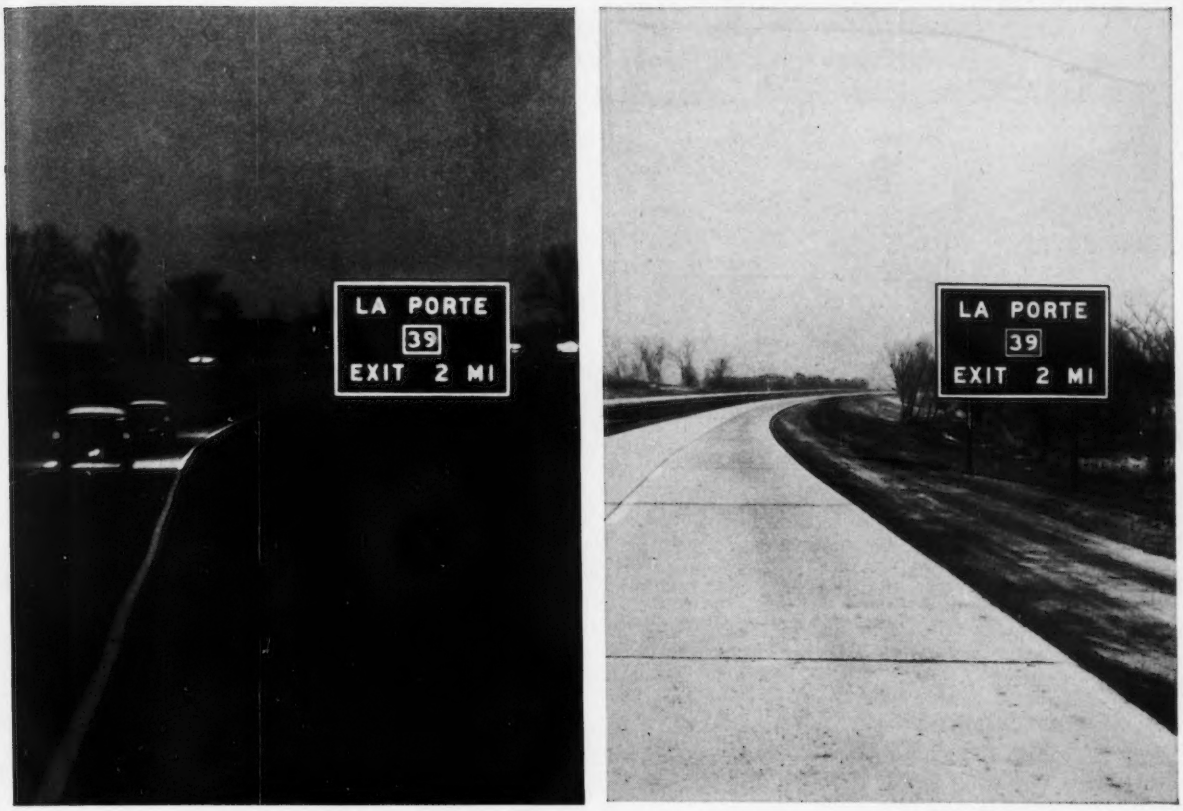
VIII. Coordination of Highway Transportation Elements

As our cities are rebuilt, one of the most important elements will be replanning for streets, parking and transportation. In the new planning for redevelopment, very careful traffic planning and design must be employed so that the revised highway transportation pattern will serve and benefit the redeveloped areas rather than prove detrimental to them.

The potentialities of the motor vehicle and the highway, and capabilities of drivers must all be given proper balanced consideration if highway transportation is to be safe, efficient, and economically sound. Realizing this, and anticipating the larger problems of the future, members of the work-conference recommended as a first step that the Institute of Traffic Engineers seek an exploratory work-conference with representatives of automobile manufacturers. The objectives would be to exchange information and viewpoints, explore likely future developments, delineate areas of mutual concern, and consider desirable future activities of joint interest.

Such a conference would be a first step toward a much broader national conference with others vitally concerned, such as planners, real estate and other economists, highway designers, motor vehicle administrators, enforcement officials, psychologists, representatives of highway users and of business interests servicing highway users. Such a conference should have continuing functions. The basic responsibilities of this group would be to examine on a continuing basis the future of highway transportation, to consider emerging or potential problems, and to develop mutually acceptable measures so that efficient, economical, and safe highway transportation can perform its proper growing role in the United States.

Start Now
to Plan for
DETROIT
in
SEPTEMBER
MARK YOUR CALENDAR
September 23-26, 1957
Statler Hotel, Detroit, Michigan
27th Annual Meeting, ITE



STIMSONITE signs, read easily day or night, are standard on most of the nation's new controlled-access highways.

on the Indiana Toll Road...

STIMSONITE SIGNS SHOW THE WAY

STIMSONITE letters assure sharp legibility even in the dangerous hours of dawn and dusk.

Night or day, STIMSONITE signs provide brilliantly legible, attention-compelling messages. Because they "speak louder" than other signs they are *safer* signs for high speed traffic. That is why STIMSONITE is *first* choice for the nation's major highways.

Embossed, aluminum cut-out letters, assembled with STIMSONITE® plastic reflectors, are non-fading and weather proof; they do not require maintenance or renewing. The unique prism construction of the STIMSONITE reflectors returns the maximum amount of light from headlamps, thus ensuring optimum visibility.

Qualities like these make STIMSONITE signs the safest and most economical choice for your signing programs. Specify them for the outstanding efficiency and economy they offer.

STIMSONITE® *for* — *Seeability* / *Readability* / *Durability*

AGA DIVISION

ELASTIC STOP NUT CORPORATION OF AMERICA

1027 NEWARK AVENUE, ELIZABETH 3, NEW JERSEY

New Publications

Businessman's Guide to the Road Program.

Chamber of Commerce of the U. S., 1615-H-St. NW, Washington 6, D.C., 1957, 50 pp., $1.00.

Seventeen nationally known highway and transportation authorities are quoted answering questions about the new highway program. What is the program? What will it mean to our cities? to industries? Who will build the roads? How will they be financed? What about access control? What should the community do to help the program along?

These and many other points are covered in the 13 chapters. C. D. Curtiss, Rex M. Whitton, John A. Volpe, George W. Barton, Henry A. Barnes, A. E. Johnson, Joseph Barnett and A. C. Clark are among those quoted.

Traffic Accident Investigator's Manual for Police.

Northwestern University Traffic Institute, 1704 Judson Avenue, Evanston, Ill., Third Edition, 1957, 617 pp., $7.50 (20 per cent discount on quantities of 25 or more).

This is a new and completely revised edition of the manual originally published in 1940.

Editor and principal author of the new volume is James Stannard Baker, the Institute's director of research and development and one of the country's leading authorities on motor vehicle accident problems.

The Institute says that the book is the most detailed and comprehensive treatment of the problems of traffic accident investigation ever published. It contains 35 chapters, more than 600 pages, and 352 illustrations. There are 189 photographs, 114 drawings and diagrams, 25 illustrations of forms used in accident investigation, 21 tables, and 3 charts.

Designed primarily for training police investigators, the book also contains valuable material for investigators with special interests in the legal aspects of accidents and accident investigation. Among the chapters of special value in this area are "What the Road Shows," "What the Vehicle Shows," "Accident Reconstruction," and "Analysis of Accidents to Determine Causes."

The 1954 edition of the manual (last previous edition) contained only 18 of the present chapters. Many of these have been completely re-written, enlarged, and brought up to date. Some of the new chapters first appeared in the *Traffic Digest & Review*, monthly magazine of the Traffic Institute, but many appear in the new text for the first time anywhere.

Indicating the completeness of detail covered, the book's index covers 18 pages and includes more than 2,300 entries.

Work on "Supplementary Field Notes" and "Analysis of Causes," two of the present chapters, was originally done as part of a cooperative project of the Traffic Institute and the U. S. Bureau of Public Roads.

Highway Research Review—4A.

Highway Research Board, 2101 Constitution Ave., Washington 25, D. C., February 1957. 74 pp.

This volume, part of a series, is designed to provide a listing, classified by subject, of highway research projects in progress or reported by state highway departments, federal bureaus, colleges and universities and other agencies. The present listing supplements and does not duplicate one issued in November 1955.

Some 45 classifications are listed, with some divided into sub-classes. Traffic, for instance, has a total of nine sub-headings, and perhaps another fifteen of the major headings will have more or less interest to traffic engineers.

Right of Way, 1956.

Bulletin 140, Highway Research Board, 2101 Constitution Ave., Washington 25, D.C., March 1957, 83 pp., $1.60.

As in previous years, the Committee on Land Acquisition and Control of Highway Access and Adjacent Areas has summarized developments in the field of the Committee's interests during the year 1955 in bulletin form. Papers presented at the open session of the Committee during the Annual Meeting of the Board in January 1956 also are included.

Various phases of the expressway problem formed the subject of three of the papers presented. "Limiting Access to Existing Highways," by William E. Duhaime, explores the legal aspects of converting a conventional-type highway to one of expressway design. In "Regulation of Access Versus Control of Access in Oklahoma," LeRoy A. Powers relates how his state has successfully utilized the police power to control access to expressway projects. Finally, Joseph L. Intermaggio discusses the importance of relating highway planning to over-all urban planning in "Expressways and Urban Planning."

Protection of the roadside is the theme of two other papers, including "Administration of Highway Protection Laws," by Adolf Feifarek, and "The Problem of Highway Encroachments in New Jersey," by Alexander W. Muir. Feifarek discusses some new ideas in roadside protection being developed in Wisconsin; Muir outlines techniques and methods utilized by New Jersey in a recent effort to rid the roadside of undesirable encroachments.

Accident Analysis and Impact Studies.

Bulletin 142, Highway Research Board, 2101 Constitution Ave., Washington 25, D.C., March 1957, 50 pp., $1.00.

This bulletin contains five papers presented at the 35th Annual Meeting, January 17-20, 1956.

"Automotive Collision Impact Phenomena," by A. L. Haynes, R. H. Fredericks, and W. J. Ruby, reports the findings from a series of controlled car crashes conducted by the Ford Motor Company. Items such as deceleration of passenger compartment, seat belt loads, occupant decelerations, etc., are reported graphically as they vary with impact velocity.

"A Preliminary Study of Speed as Related to Injury-Producing Automobile Accidents," by John O. Moore, examines accident and injury data on 3,203 automobiles involved in injury-producing accidents to determine effects which speed may have on the frequency of dangerous or fatal injuries.

"Factors Related to Traffic Death Rates," by Earl Allgaier and Sam Yaksich, reports a study, through statistical techniques, of the various characteristics of the various states that are related to the traffic death rates.

"Highway Accident Analysis Through Use of IBM Punch Cards," by Paul R.

Tutt and William R. Welty, reports the method developed by the Texas Highway Department for the analysis of highway accident data and the presenting of such data in a form useful at the district level.

"Virginia's Cooperative Accident Analysis System," by Alfred Vick, III, describes the system developed and operated cooperatively by the highway department and the department of State Police for the determination of accident frequency rates; the listing of essential details of the individual accidents for use in formulating corrective measures when needed; and the pinpointing of specific locations where accident occurrence is abnormal.

Highway Laws.

Bulletin 145, Highway Research Board, 2101 Constitution Avenue, Washington 25, D.C., April, 1957. 54 pp., $1.00.

This bulletin contains the papers presented at the Highway Laws Committee session at the 35th Annual Meeting of the Highway Research Board, and the Report of the Committee on Highway Laws for 1955.

Included are the following papers:

"State Highway Officials and the Laws Project," by A. E. Johnson, executive secretary of the American Association of State Highway Officials.

"The Bill to Revise Federal-Aid Highway Laws," by Henry J. Kaltenbach, former solicitor of the Bureau of Public Roads.

"Municipalities and Highway Laws," by Patrick Healy, Jr., executive director of the American Municipal Association.

"Highway Laws from the County Point of View," by Keith L. Seegmiller, general counsel for the National Association of County Officials.

Discussion on "State Highway Laws Studies," moderated by Roy E. Jorgensen. W. Crosby Pegues, Jr., Louisiana; L. N. Ress, Nebraska; Archie Smith, Rhode Island; and Joseph A. Sullivan, Michigan, presented reports of laws studies in their states.

The "Report of the Committee on Highway Laws for 1955," by David R. Levin, secretary, contains a progress report of the work of the Highway Laws Project staff and the most significant developments in highway law during the year. It also includes a reprint of the most significant judicial decisions in 1955, as reported in the Highway Research Correlation Service memoranda of the Committee.

with COX & STEVENS ELECTRONIC SCALES

Get accurate axle load data with no interruption of truck traffic. Trucks are weighed at all normal speeds with Cox & Stevens Electronic Highway Scales. Record axle weights, total weights, speeds and axle spacings on permanent tape.

Motion weighing eliminates delays for trucks... keeps the good will of the trucking industry. Scale platforms are set flush in the highway on weather-proof electronic load cells. No moving parts. Platform deflects only a few thousandths under load. Recording instruments that go along with scale are portable to collect data from scales at various locations.

Cox & Stevens electronic motion-weighing equipment is now installed in Iowa, Virginia, Minnesota and Oregon. Find out how these scales of the future can help your highway planning program today.

FEATURES OF COX & STEVENS ELECTRONIC HIGHWAY SCALES

- Built-in Experience — Developed in cooperation with the Bureau of Public Roads.
- Compact Scale Instrumentation — Portable if necessary.
- Easily Serviced — Plug-in Components for quick, simple maintenance.
- Accurate at Wide Speed Range — Records true weights at all normal truck speeds.

30

Write for bulletin 3005.

ELECTRONIC SIGNAL CO., INC.
19 West 50th Street, New York 20, N. Y.

neptune
A Subsidiary of Neptune Meter Company

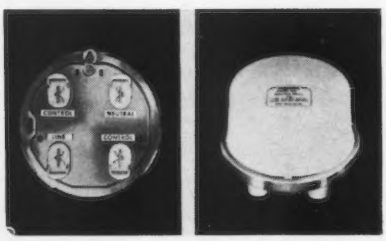
Strictly Business

Street Lighting Control Relays Available Now

A series of multiple relays for control of street and highway lighting is in production at Micro Balancing, Inc., Garden City Park, N. Y. Models are designated as Lumatrol WM, WMF, WMFB and PM. All feature lifetime mercury to mercury contractors, stainless steel non-breakable contractor housing and reliable operation within a broad range of line voltages.

Model WM and WMF will fit all standard watt hour meter cases, with WMF including a built in 30 ampere fuse. Model WMFB has the fuse mounted on the back plate, and will fit all meter cases with sufficient fuse clearance. The PM models parallel the WM series, but are designed for pole mounting and requiring no meter base. These are equipped with #10 18-inch stranded leads. All will provide reliable operation from a line voltage range of 90-130 volts, 60 cycles AC.

A feature of all Lumatrol controls is the specially formulated housing which provides complete weather protection, highly resistant to discoloration and cracking even in the most severe climates. Technical bulletins are available.

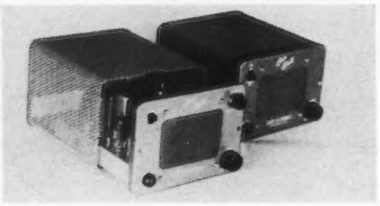


New Fixed Frequency VHF Mobile FM Receiver

A new FM model of the popular Car Call mobile receiver, used extensively in radio paging, has been announced.

This new model F Car Call receiver, which sells for $97.50, is ideal for use as an auxiliary mobile receiver in conjunction with the many two-way mobile services in the 30 to 50 megacycle band such as Police, Ambulance, Fire, Utilities, Petroleum, Trucking, Towing and Forestry.

This Car Call receiver is a highly sensitive, crystal controlled, fixed frequency mobile receiver which will operate on either 6 or 12 volts. Completely self-contained, it requires no connection with the auto radio. It can be operated directly from the regular auto radio antenna without affecting the operation of the auto radio, thus eliminating the need for a separate antenna. An effective squelch circuit, adjustable from the front panel, is included for complete quieting of the receiver between calls. Featuring drawer type construction for easy access, the 8 tube model F Car Call receiver has a low current drain of only 6.8 amperes at 6.3 volts or 3.4 amperes at 12.6 volts. When on standby the receiver draws only 2.6 amperes and 1.3 amperes respectively.



Complete information and specifications are available from the manufacturer, Seeley Electronics, 1060 South La Brea Avenue, Los Angeles 19, Calif.

Washing Machine for Tunnel is Developed

Wash-day worries are over for the housekeeper of Mobile's Bankhead Tunnel.

A specially designed washing machine—the only one of its kind—has been built for the City Commission to cut the tunnel's "wash-day" from three weeks to three or four nights.

The machine consists of three basic units—a 44-inch nylon brush, a lift-truck with hydraulically operated controls that place the rotary brush at almost any angle against the tiled tunnel walls and ceiling; and a tank-trailer coupled to the lift truck. The trailer carries 650 gallons of water and 80 gallons of detergent, a sufficient amount for a trip through the 3,000-foot tunnel. The machine was manufactured by Ross and White Co., Chicago, low bidder. Cost of the complete unit was approximately $29,000.

Purpose of the machine is not only to improve tunnel "housekeeping" but also to assure maximum illumination in the tube. The washer is part of the tunnel re-lighting program, according to the City Commission, and was bought with tunnel funds.

Steam and "elbow grease" were previously used to clean the tunnel on an irregular basis. With the new machine, the walls will be cleaned weekly and the ceiling monthly. The tunnel is being washed at night, when traffic through the tube is lightest.

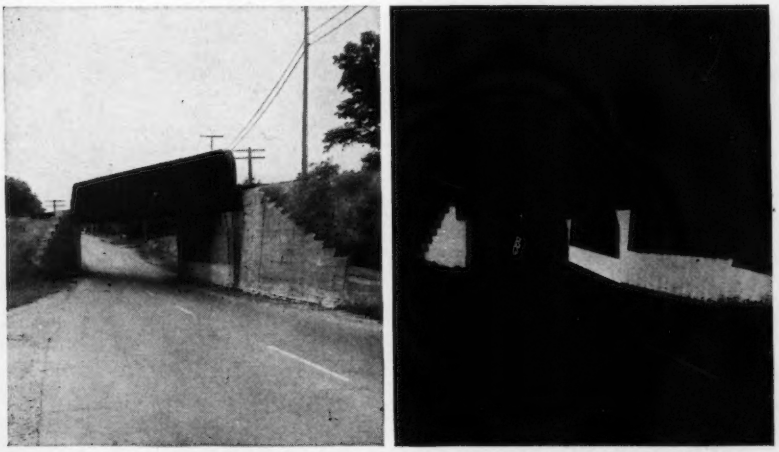
Now there is a quick, easy way to reflectorize traffic hazards

You asked for a fast, simple, low cost way to reflectorize traffic hazards, so we put our research laboratories to work on the problem. They came up with the answer . . . and we named it "Codit" Reflective Liquid.

What is "Codit" Liquid?

Scientifically, it is a suspension of reflective elements in a solvent-dispersed vehicle. That means it is a liquid that has minute glass beads in it.

You simply apply the liquid to any rough or porous surface, and the film formed holds the glass beads in a tight grip. Thus, in only one easy brush stroke, you can give any traffic hazard the safety of a bright reflective warning.



Would-be death trap flashes its own warning when painted with "Codit" Reflective Liquid.

"Codit" Liquid adheres to any rough or porous surface . . . wood, concrete, metal, etc.

How does it Reflect?

"Codit" Liquid gives you wide angle reflectivity you can see from any angle of approach. Since it is a reflex-reflector, it catches the approaching headlight beam and directs the gathered light right back to the source. The driver then sees a warning that is 40 to 50 times brighter than white paint.

At night, the reflective warning appears as a glareless silver-white color, and by day it is a neutral gray.

Application ease and low cost

Remarkably rugged "Codit" Liquid can be easily applied by hand spray gun, tank type spray equipment, or by a simple kalsomine brush. It is also available in handy aerosol spray cans for extra convenience. You just spray it on or brush it on in a jiffy. It dries in minutes. And you've finished the whole reflectorization job.

A little goes a long way, too. One of those small 6 ounce aerosol cans will cover 6 to 8 square feet with reflective safety that keeps its brightness for a full year.

The cost is easy to take as well . . . less than 17 cents per square foot of coverage. Or for instance, you can reflectorize 10 feet of curbing for about 50¢. This is a real safety bargain.

Where to use it?

Put it on any temporary or permanent objects in or near a roadway that constitute serious hazards to traffic. "Codit" Liquid will adhere to any rough or porous surface—wood, metal, gravel, concrete and the like.

You can use it effectively on road construction or repair barricades, hydrants, underpass abutments, culvert walls, bridge ends, curbing, guard rail posts, islands, trees . . . literally everything you want to use it on for fast reflectorization.

Special introductory offer

Right now, at a special introductory low cost, you can reflectorize traffic hazards the quickest, easiest way yet. For only $69.50 you can get a complete "Codit" Reflective Liquid Kit, containing everything—(from brushes to 4 pound cans to 6 ounce aerosol cans to stencils)—you need for hazard marking.

Introductory kit contains everything you need to apply "Codit" Reflective Liquid.

You can get this kit from your 3M Field Representative. Or you can either get more information or the kit itself by writing:

3M Company,
Dept. GS-57, St. Paul 6, Minnesota.

REG. U. S. PAT. OFF.

CODIT

BRAND

REFLECTIVE LIQUID

PRODUCT OF 3M COMPANY RESEARCH

The terms "Codit" and "3M" are registered trademarks of Minnesota Mining & Mfg. Co., St. Paul 6, Minn. General Export: 99 Park Ave., New York 16, N.Y. In Canada: P.O. Box 757, London, Ont.

1935—Workmen demonstrate ease of handling removable aluminum bridge railing on the International Bridge.

1957—New bridge, same railing.

New International Bridge Spans the Rio Grande At Laredo, Texas

A new International Bridge once again spans the Rio Grande at Laredo, Texas, replacing the old one wiped out by flood in 1954.

But although the bridge is "new," one old veteran remains in service—the bridge's aluminum railing.

The International Bridge, most traveled route between the United States and Mexico, was first built in 1922. When its original concrete railing was washed away in the flood of 1932, Aluminum Company of America presented the idea of an Alcoa aluminum railing to bridge authorities.

In addition to offering an attractive appearance, resisting corrosion, and requiring no maintenance, the railing's light weight made possible an installation where the railing could be removed in 90 minutes in case of high water.

By removing the railing, the bridge would be streamlined and would offer less resistance to flood waters surging over it. Hence the bridge would stand a far better chance of surviving future floods.

The bridge did survive floods, until the all-time record flood of 1954. In that flood, water reached a level of 62½feet above low water, 21½ feet higher than the bridge itself.

When the waters subsided, the bridge had been washed away, but city officials had the bridge's 1,720 feet of aluminum railing, which had been removed in time.

Bridge officials immediately began to plan for a new bridge. The main route between the United States and Mexico, International Bridge was accustomed to handling 14,000 pedestrians and 8,000 vehicles daily.

Officials soon learned that relocation of the bridge was undesirable. The cities of Laredo, Texas and Nuevo Laredo, Mexico, had built up at each end of the bridge. A material change in location would change the entire business layout of both cities.

Engineers also rejected the idea of raising the bridge's elevation. The promise of the Diablo Dam at Del Rio, Texas, greatly lessened the danger of future destructive floods.

So planning went ahead for a new bridge of the same elevation and same location as the old one. And first plans

called for use of the old aluminum railing, stacked up in a Bridge System warehouse, and as good as new after 24 years use.

The railing was reinstalled with the same removable properties as before. Thus the new bridge is equipped with this flood insurance until the Diablo Dam is completed.

In addition to the old railing, the bridge features something new, 20 aluminum davit-type design light standards. Made of Alcoa aluminum by Union Metal Company of Canton, Ohio, the lighting standards are also removable, thanks to the lightweight properties of aluminum.

Variable Intensity Featured on Dutch Traffic Signal

A portable traffic signal has been designed for use by police in the Netherlands. The device, which is marketed by N. V. Zoetmulder & van Winkel of The Hague, is odd-looking by U. S. standards, but it has an interesting feature in that the intensity of the signal indications can be varied.

The technique is simple. The daytime intensity is high, achieved by using inner-mirrored lamps, or those with an aluminum-plated back. At night, when this intensity is not needed and is even objectionable, the light output is reduced by introducing into the circuit a resistance in the form of lamps to illuminate the police on duty at the signal, which is portable and is controlled by an officer. The reduction could also be achieved by use of a fixed resistance to be cut into the circuit at night.

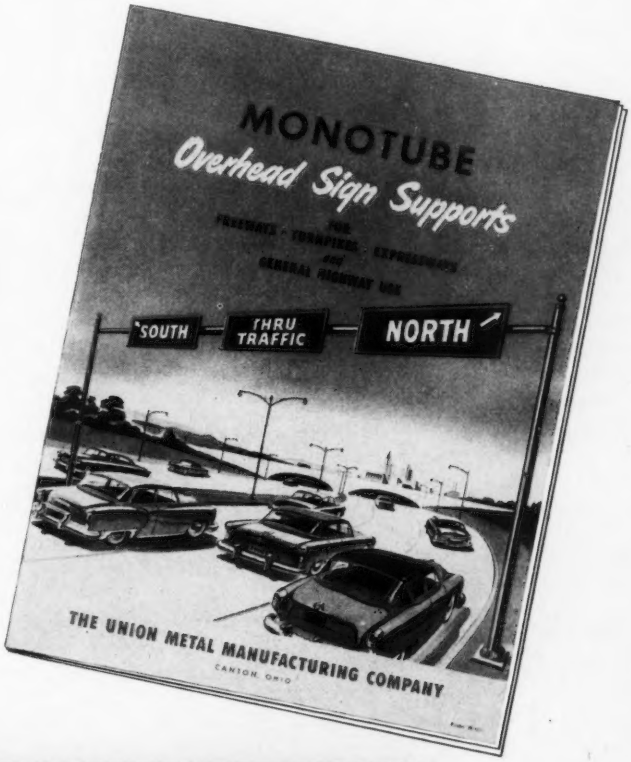
Learn how MONOTUBE Sign Supports solve highway marking problems

UNION Metal Catalog No. 88 clearly explains why Monotubes are first choice for overhead sign support use. With steel Monotubes, you benefit from superior strength, easy installation, attractive appearance, and greatly reduced maintenance.

These structures are designed on the basis of a maximum sign area of 100 square feet, and a weight of 500 lbs. They meet heavy loading district requirements of the National Electrical Safety Code.

In addition to photos of typical installations, the catalog includes details of assembly and installation, dimensional data and range of standard types.

Write TODAY for your FREE copy of Catalog No. 88. Address The Union Metal Manufacturing Company, Canton 5, Ohio.



UNION METAL
Overhead Sign Supports

THE UNION METAL MANUFACTURING COMPANY
CANTON 5, OHIO

Please send me your Catalog No. 88 on Monotube Overhead Sign Supports.

NAME_____

TITLE_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

Institute Affairs

Benefit-Cost Study

The Bureau of Public Roads has invited the Institute of Traffic Engineers to help in the Highway Cost Allocation Study required by Section 210 of the Highway Revenue Act of 1956.

To meet the statutory directive, three major analyses will be made:

1. The comparative benefit analysis, evaluating benefits received by motor vehicle users and nonmotor vehicle users;

2. The differential cost analysis to ascertain the tax responsibilities of vehicles of different types and sizes (in which the so-called incremental and the "cost" — "function" approaches will be used); and

3. The differential benefit analysis which will explore this same problem from the standpoint of benefits. In this latter analysis, the gross ton-mile approach will be studied.

The four major blocks of work needed in making the analyses are:

1. The evaluation of benefit factors, both vehicular and nonvehicular;

2. The measurement of highway use;

3. The measurement of highway needs and costs, both Federal-aid and non-Federal-aid;

4. The evaluation of differential cost factors for the incremental and cost function studies.

To coordinate the work and perform the critical phases of the analyses, a small staff named the Central Analysis Group has been formed in the Bureau. In addition to cooperating agencies, such as the state highway departments and the Interstate Commerce Commission, it is planned to name an advisory panel of qualified engineers, economists and statisticians to provide expert advice from time to time.

User, industry and other interested groups such as the Institute are being invited to submit briefs setting forth their views. A letter inviting such views and asking whether the addressee would be willing to respond to specific inquiries has been sent out over the signature of G. P. St. Clair, Director of the Study. It is not intended that parties of interest will be represented on the Advisory Panel.

The bulk of data collection and preliminary analysis is scheduled for 1957 with the major part of the analytical work and the preparation of the report planned for 1958. The final report is due March 1, 1959.

The "prospectus" contains a detailed discussion of the differential cost analysis (incremental approach) and the benefit analysis.

Past President's Award

The Past President's Award Committee continues to be very active. Several entries are in, and others are promised. A general letter has gone out to all Juniors and Associates, and a news release has been prepared and sent to other publications.

Particularly helpful has been the activity of the local sections. Through mailings and announcements they have helped spread the word.

If you are eligible, how about submitting an entry? If not eligible, why not encourage an eligible friend or associate to enter? Thesis work of members will qualify, but the choice between a full or an abridged version is up to the entrant.

Seattle Rewards Safe Drivers

The City of Seattle recently honored 51 drivers for the City's Engineering Department, each driver having gone five years or more without a chargeable accident. A number of those honored were on Ed Lewarch's staff. Congratulations to all the winners!

How many ITE members could have made the winner's circle at such an affair?

Technical Council to Meet

The Technical Council has planned a meeting in Chicago June 28 and 29. All Department Heads are urged to be present. It is hoped that action can be taken on a number of committee reports.

Work-Conference Report Published

Elsewhere in this issue is a report on the Pittsburgh Work-Conference. Although the report is being printed a year and a half after the meeting, the thinking and the conclusions have not suffered by the passage of time. They seem as appropriate today as when they were first set down—if not more so.

A most important question now is—where do we go from here. One thing is sure, and that is that we must not stand on dead center. Several suggestions are made in the report — your advice on implementing these will be welcomed.

Coming Events

June 3-7 — AMERICAN SOCIETY OF CIVIL ENGINEERS—
National Convention, Statler Hotel, Buffalo, N. Y. Contact: ASCE, 29 W. 39 St., N. Y. C.

June 7-8—INSTITUTE OF TRAFFIC ENGINEERS, TEXAS SECTION—
Semi-annual Meeting, Shamrock-Hilton Hotel, Houston, Texas. Contact: Eugene Maier, Room 210 City Hall, Houston, Tex.

June 11-15—WESTERN ASSOCIATION OF STATE HIGHWAY OFFICIALS—
Annual Conference, Shamrock-Hilton Hotel, Houston, Tex. Contact: R. C. Faltinson, Texas Hwy. Dept., Austin, Tex.

June 25-27 — INSTITUTE OF TRAFFIC ENGINEERS, WESTERN SECTION —
Cosmopolitan Hotel, Denver, Colo. Contact: Jack Bruce, Traffic Engineer, City & County Bldg., Denver 2, Colo.

September 9-13—ILLUMINATING ENGINEERING SOCIETY —
National Technical Conference, Biltmore Hotel, Atlanta, Ga. Contact: IES, 1860 Broadway, N. Y. 23, N. Y.

September 23-27 — INSTITUTE OF TRAFFIC ENGINEERS—
Annual Meeting, Statler Hotel, Detroit, Mich. Contact: ITE, 2029 K St. N.W., Washington 6, D. C.

September 24-27 — AMERICAN ASSOCIATION OF MOTOR VEHICLE ADMINISTRATORS —
Annual Conference, Hotel Roanoke, Roanoke, Virginia. Contact: AAMVA, 912 Barr Building, Washington 6, D.C.

October 13-17 — AMERICAN INSTITUTE OF PLANNERS —
Annual Meeting, Congress Hotel, Chicago, Illinois. Contact: AIP, 34 Brattle St., Cambridge 38, Mass.

October 14-18—AMERICAN SOCIETY OF CIVIL ENGINEERS—
National Convention, Statler Hotel, New York City. Contact: ASCE, 29 W. 39 St., N. Y. C.

October 21-25—NATIONAL SAFETY COUNCIL—
Annual Safety Congress & Exposition, Congress, Conrad Hilton and other Hotels, Chicago, Ill. Contact: NSC, 425 N. Michigan Ave., Chicago 11, Illinois.

November 18-22 — AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS—
Annual Meeting, Conrad Hilton Hotel, Chicago, Ill. Contact: AASHO, National Press Bldg., Washington 4, D.C.

Section News

CANADIAN SECTION

Grant A. Bacchus, Secretary

Toronto Group Meeting—January 17, 1957

A dinner meeting was held at the Chez Moi Tavern in Toronto on Thursday, January 17th and was attended by 32 persons. *Walter Macnee* reported on the completion of application forms for Local Section Affiliate Membership. It was proposed and approved that membership committees be established for each of the three regions in the Canadian Section. The membership committees will comprise the Past-President and Secretary-Treasurer of the Section and the Regional Director for the region from which an applicant applies.

Larry Forster of the Ontario Department of Highways announced a sign test to be carried out on some new signs being proposed by the Department. One of these signs is a new type of railway crossing warning sign which, it is hoped, will reduce the possibility of drivers failing to see railroad crossings as they approach them.

Tom Mahony presented a report on his trip to Chicago where he attended the National Safety Conference and a meeting of the Midwest Section of the I.T.E. *Harry Burns* reported on the progress of the Joint Committee formed by the C.G.R.A. and the Canadian Section of the I.T.E. which is preparing the Canadian Manual of Uniform Traffic Control Devices. The initial draft of this manual will be ready for perusal this spring.

Considerable discussion was held on the possibility of promoting the City of Toronto as the site for the 1960 ITE convention. *Grant Bacchus* reported on the conversations and correspondence held with the Directorate of the ITE and it was decided by those present that a committee composed of *Grant Bacchus, Sam Cass, Walter Macnee, Art Lomax* and *Bob Burton* would continue working on this matter.

Toronto Group Meeting—February 19, 1957

A special meeting of the Toronto area members was held at the Chez Moi Tavern on Tuesday, February 19th at which 65 persons were in attendance including visitors from Kitchener, London, Sudbury and New York. We were extremely pleased to welcome *Ed Horton* back who has fully recovered from his recent automobile accident. Our special guest was *Mr. J. E. Leisch* of DeLeuw Cather and Company of Chicago. *Mr. Leisch* was formerly with the Bureau of Public Roads where he spent considerable time on the research leading to the publication of the AASHO policy on Geometric Design of Rural Highways. His last major work with B.P.R. was the development of a companion policy for Urban Highways and, with the aid of slides, he presented a summary of the contents and development of this manual. His very interesting and informative talk was well received by all of those present and we are indebted to *Mr. Leisch* for taking time out of his busy schedule to present it to us.

News Briefs

Toronto: We are pleased to announce that *John L. Vardon* was elected as a Junior member of the ITE at the recent Directors' meeting in Washington. John is a 1955 Civil Engineering graduate from the University of Toronto and is Acting Route Analysis Engineer in the Traffic Engineering Section of the Ontario Department of Highways.

Montreal: Jacques Barriere has been promoted to the position of Deputy-Director of the Montreal Traffic Department under Director *Jean Lacoste.* Jacques was formerly in charge of the Traffic Survey Section in the same Department.

Toronto: Walter Macnee has announced that *John Vardon, Larry Forster, Dick Hopkins* and *Irv Weinberg* of the Department of Highways will be attending the Seminar on Traffic Engineering presented by the Traffic Institute of Northwestern University between March 4 to 22.

Toronto: The Traffic Section of the Ontario Department of Highways has just completed a study of the level crossing accidents in Ontario. This study will be used to recommend changes in the types of railway crossing protective measures now in use.

The Sign of TASSCO Traffic Safety
TRAFFIC CONTROL SIGNS
TRAFFIC and STREET SIGN COMPANY
NEWARK, NEW JERSEY · MARKET 3-5640

YOU'LL WANT A PERSONAL COPY

Here's the big, new, comprehensive catalog from the nation's leading specialist manufacturer of traffic and street signs in every category.

The Tassco catalog is illustrated in full color, showing hundreds of signs now in use by many of the most modern, economy-minded municipalities in America.

For your copy of the new Tassco Catalog, write for Catalog TSM.

The Sign of TASSCO Traffic Safety

TRAFFIC & STREET SIGN COMPANY, 84 FOUNDRY ST., NEWARK 5, N. J.

Toronto: Ross Raymond has announced that his firm—Municipal Planning Consultants—has been appointed as consultant to the Woodstock Planning Board. This relatively new company appears to have become reasonably successful in the year since its inception which should be encouraging to anyone entertaining thoughts of entering the consulting field.

Oakville, Ontario: Ed Ewens announced that he has resigned his consultant position of Traffic Engineer for the City of Kitchener to devote more time to his other clients.

Toronto: Our readers will recall that the last two issues of the newsletter have contained an article by *Tom Hewton* of the Metropolitan Traffic Engineering Department on modification of traffic signal controllers. The Metropolitan Corporation has applied for patents on the device and is considering granting a license to the Canadian General Electric Company to manufacture and market the device.

METROPOLITAN (New York) SECTION

Arnold G. Fisch, Secretary

The first annual ladies night of the Metropolitan Section was held on March 14th. The dinner started at 7:00 P.M., preceded by a cocktail hour.

President Quimby informally opened the meeting at 8:30 with the following announcements:

The Greater New York Safety Council would hold their annual meeting on Monday, March 18th, and —

All Junior and Associate members of the Institute are urged to participate in the Past President's Award.

The next meeting was announced for April 24th and will consist of a field inspection of the operational facilities at Newark Airport.

The speaker for the evening was Mr. Theodore W. Geiser, Attorney for the New Jersey Highway Authority, who addressed the section on the general topic of "Accentuate the Positive." In this talk Mr. Geiser stressed the cooperation which can and must exist between traffic engineers and the legal authorities of the municipalities, counties and states.

Mr. Geiser's talk was well received and he was urged to submit it for publication in TRAFFIC ENGINEERING. *(The article has been submitted and will appear in an early issue.—Ed.)*

MIDWEST SECTION

Elizabeth McLean, Chairman, Publications Committee

March Meeting

The March meeting of the Midwestern section was "Student Night." Over ninety persons attended the monthly ITE dinner including about 25 students from the Northwestern Traffic Engineering Seminar and about 10 from the U. of Illinios student ITE chapter. *Fred Hurd* was the guest speaker and he presented a very interesting talk on "The Future of Traffic Engineering." While Fred was talking firemen were fighting a fire up the street a piece in the City Hall. Some of the city contingent were wishfully thinking that they might miss a few days work—but alack the fire was confined to the Council Chambers and Aldermanic offices.

Rapid Transit in the Congress Street Expressway

Present plans call for rail-bound transit trains to start operating in the median strip of the Congress Street Expressway, within the City of Chicago, in the latter part of this year. That portion of the route beyond the city limits will utilize temporary trackage until sometime in 1958. Stations will be a minimum of one-half mile apart, and with superelevated, high speed curves, minimum running times will be possible. To provide the utmost in speed, with safety, regardless of traffic volume, train headway or weather condition, the most modern signal and train control equipment is being installed.

Station buildings will be located at the bridge level of streets crossing the rapid transit facility. The building elevation facing the cross street will be largely glass and the side elevation partially of glass with electrical promotional signs visible to approaching vehicular and pedestrian traffic. Agents booths, coin operated turnstiles, and transfer issuing and validating machines will be located in the buildings to expedite passenger movements. Station building interiors will be highly illuminated and faced with glazed tile, stainless steel, glass and aluminum for attractiveness and ease of maintenance.

Access to the train stop platform will be by means of sloping pedestrian ramps enclosed with aluminum roofs, corrugated structural glass sidewalls and concrete floors. The train stop platforms will be 600′ in length, sufficient to accommodate a 12-car train. The platforms will be concrete with a cantilever type, single aluminum column supported roof canopy extending from the center to beyond the platform edge. Windbreaks, parallel to the platform length, will be provided at intervals. The platform area will be illuminated with fluorescent tubes with a higher intensity of illumination in the area of the train stop. In this manner the greatest comfort and convenience will be provided to the passengers of this route.

This will be the first modern facility in the nation where rail-bound rapid transit has been provided in conjunction with expressway pavements. As such, this project will be watched with keen interest by traffic and transportation engineers in this country and other parts of the world.

Chatter

John Baerwald, Prof. Wiley, et al, are still wondering what happened to the refreshments at the "Traffic Jam" in Champaign. Seems as how everyone remembered the old saying, "Let George do it," only he didn't know!

We are happy to report that *Mike Powills, Dick Walons* and *Jack Sorenson* got home after the last meeting, contrary to rumors that they are on the Police Department's list of missing persons.

Usually reliable sources have informed us that *Dick Kanak* is engaged. This just proves that homemade dumplings can win out over Cicero Federal's 3½ per cent every time.

Word has just reached us that *Martin Bruening* is experimenting with an all-green vehicular phase to complement the all-red pedestrian. (We really didn't get any such word—we invented that because *we get no words from Milwaukee.*)

Our Park District sources inform us that *Chuck Muris* was recently awarded an Oakley (Blvd.) cluster to his Order of the Red Raiders of Cornell (Dr.) for discovering an intersection wherein the Boulevard G/C was less than 0.75. (We invented that too—the Park District doesn't tell us much either.)

Phil Linscott recently returned from a five state jaunt. To show you how rapidly these boys in private industry are moving, we understand that *Bill McConochie* recently asked Phil if he'd like to go to the moon.

Gerry King reports that some dirty thief made off with *Al Plantain's* compost pile—he's had to start smoking tobacco again.

NEW ENGLAND SECTION

A. Wallace Gove, Secretary

The third meeting of the 1956-1957 season was held on Monday, March 18, 1957, at Club 57, Boston, Massachusetts. The dinner and meeting followed an all day session of the 36th Annual Massachusetts Safety Conference held in the Hotel Statler, Boston.

After an excellent dinner of roast beef or chicken per individual choice, *President Johnson* introduced head table guests and other prominent members and visitors.

President Johnson expressed appreciation to the Section delegates to the Connecticut Technical Council for the work done on proposed legislation for the registration and licensing of engineers in Connecticut.

He then called the attention of the members to a communication from the Board of Direction concerning "lobbying." To maintain the tax exempt status of the Institute lobbying cannot be a substantial part of the activities. The letter, with the accompanying legal counsel's opinion, was ordered filed with the Secretary.

President Johnson next presented a communication from *Charles W. Prisk,* imme-

19 SIGNAL CIRCUITS!

...Eagle controller is wired for tomorrow's traffic

True, you may not need 19 circuits today. But this table shows how you may need them in the not-too-distant future. Then remember that this Eagle EF-20 controller is already wired for 19 circuits. You won't have to have it "rebuilt" or replaced to handle the greater traffic movement of tomorrow.

Any desired Eagle accessories can be added right in the field. Even adjustments and maintenance are easy, as components are either hinged or jack mounted.

This 3-dial controller has cycle length adjustment from 30 to 130 seconds. And each dial is furnished with 3 resets for flexibility in an interconnected system. Send for Bulletin E-20.

POSSIBLE CIRCUITS NEEDED TOMORROW	
3	for green, amber, red
1	for turn arrow
2	for walk, don't walk
6	
×3	for three-movement intersection
18	
+1	for special local condition
19	

MAIL COUPON TODAY

EAGLE

EAGLE SIGNAL CORPORATION
Municipal Division
Moline, Illinois
Eagle equipment saves lives . . . saves time

EAGLE SIGNAL CORPORATION
Municipal Division, Dept. TE-557
MOLINE, ILLINOIS

Please send Bulletin E-20 on the 19-circuit controller.

NAME AND TITLE _____

ORGANIZATION _____

FULL ADDRESS _____

diate past president, urging participation by eligible members in the competition for the past president's award to be given at the 1957 meeting to be held in Detroit.

The meeting was then turned over to *Max Halsey,* Program Chairman, who introduced the speaker, *J. Carl McMonagle,* of the Highway Traffic Safety Center,, Michigan State University, currently National President, Institute of Traffic Engineers. *Mr. McMonagle* very ably spoke on the subject "Has Traffic Engineering 'Come of Age'?" The talk was followed by a question and answer period.

Dave Baldwin, National Executive Secretary, Institute of Traffic Engineers, briefly discussed the move of the National office to Washington, and then reviewed the group insurance plan which has been accepted by the Board of Direction, and which has currently been presented to the membership with opportunity to participate. Ninety-two members and guests were present.

WESTERN SECTION

Robert E. Dunn, Secretary

ITTE Sponsors
Street and Highway Conference

The Ninth Annual Street and Highway Conference sponsored by the ITTE was its usual success. About 550 attendees were pushed, shoved and/or cajoled by *Bob Glenn* into many interesting sessions. The conference was chairmanned by *Joe Mack,* County Surveyor and Road Commissioner from San Diego County and included such visiting dignitaries as *General Campbell* (Chairman of the Board, ASF), *Joe Mattson* (ASF), *Robley Winfrey* (Bureau of Public Roads), and *Wilfred Owen* (Brookings Institute).

Bay Area Changes

Several changes in jobs have taken place recently in the area. *Jim Meyers* is settling down at DeLeuw, Cather and Company. *Don McGlashon* has joined *Hank Evans* at Wilbur Smith and Associates. *Martin Wallen* has a new associate TE in *Jim Robertson,* a January graduate of the ITTE. *Mark Kermit* takes over the reins in Contra Costa County on March 1st.

Evans Loses Limousine

Hank Evans spent some time up in Dalles City on the Columbia River working on a bridge job. Seems he had his car stolen complete with field data which the culprit thoughtfully strewed along the countryside. Hank is also working on the Richmond O & D survey and has the dubious distinction of performing the first roadside interviews in the snow in the Bay Area. Seems as though the trucks were tearing up the shoulders so fast that *Jim Robertson* had to stand by with a shovel to fill the holes. Activities were finally halted after the interviewers became snow blind and resumed the following day. A lumber truck conveniently broke an axle in the interview station requiring the station to be moved. A 40 per cent sample (of 20,000) was obtained on U. S. 40 while 80 per cent of the vehicles on the Richmond-San Rafael Bridge were stopped with the assistance of *Ed Levy* of the Bay Toll group.

Crommelin Commentates
At Berkeley Banquet

Bob Crommelin was jolted out of his easy chair in San Leandro by a pronouncement from President Al that he has been appointed Bay Area Chairman. The notification was received just in time for Bob to officiate at the dinner held in conjunction with the Street and Highway Conference. The dinner, held at the Shattuck Hotel in Berkeley, was attended by about 200 persons with the entertainment consisting of a musical (?) interlude by *Barney Vallerga* (Asphalt Institute), *Dick Wilson* (Assistant State Highway Engineer), *Ed Waite* (Deputy State Engineer), and *Red LaForge* (Engineer of Federal Secondary Roads). A movie on reflectorized signs was shown through the courtesy of *Al Bowman* and *Jake Landon* of 3 M's. *(Who else!—Ed.)* Incidentally Jake has recently given up the midwest to settle on the West Coast. The social hour before the dinner was delayed due to an absence of colored liquid which caused an undue amount of congestion around the bartenders *Roy Oakes* and *Jim Kell.*

Wallen Wants Volkswagens

Marty Wallen also reports that a parking inventory has just been made as a result of complaints that parking stalls were too short. He found that stalls ranged from 15 to 25 feet and there were a number of abandoned driveways and yellow zones. The city is considering pulling out the meters and re-installing them on a more uniform pattern rather than putting up signs reading "This Space Reserved for Volkswagens" etc. Marty anticipates about a 10 per cent reduction in the total number of spaces.

Sacramento Meeting

Fifteen members of the Sacramento area met February 4 for lunch, *Wilson, Nicholson, Tholborn,* and *Schroeder,* all of Stockton, attended in addition to the regular Sacramento crowd.

Mel West has had an operation and is reported doing fine.

Webb and *Moskowitz* attended the annual Highway Research Board meeting in January. Three thousand miles from Sacramento they were able to pass as experts on freeway operation problems.

Roy Matthews and his crew are conducting tests to determine the most effective shape of a 12-inch diameter green arrow traffic signal for use in left turn lanes and elsewhere. Five different shapes of arrows and four different types of lenses as well as several sizes of signal lamps are being tested. The problem is to find an arrow that will be readily visible during the day but will not be so bright at night as to create a "halo" effect which tends to make the arrow look round at a distance.

San Diego News

The San Diego Area membership met recently with many guests to extend its best wishes to *John MacDonald.* John has been the State Division of Highways District Traffic Engineer in San Diego for something over a year and is departing for a position with the Automobile Club of Southern California. John will not be an absolute loss to the Area though since he is planning to remain a resident of San Diego and commute to Los Angeles for the working week (lovely San Diego is smog-free . . . PLUG). Among the many guests from the Division of Highways and City and County government was *Cy Cysewski.* Cy was back in town on business concerning a large proposed shopping center in eastern San Diego. We hope Cy will make San Diego the subject of a photograph as beautiful as the one he used on his report for a similar project in Honolulu.

The San Diego Metropolitan Area Transportation Study recently presented its first report on the review of the Major Street and Highway Plan. The Study Director, *Ed Hall,* reported that the proposal, a study of major streets between La Jolla and Pacific Beach, was very well received. This study combined techniques of land use estimation and gravitational concepts of traffic orientation to predict future traffic on the routes under study.

Mountain News

Ellis Mathes is in dire need of a civil engineer who can analyze interchange service to satisfy traffic demands on the interstate system; this, of course, would be in addition to regular duties of checking traffic functions on all primary and secondary projects. (An unpaid Help Wanted advertisement.)

Utah's *Gerald Matthews* is looking for anyone with a crystal ball. The Planning Department in Utah would be most appreciative if one could be made available for the prognosticating of future traffic volumes and movements.

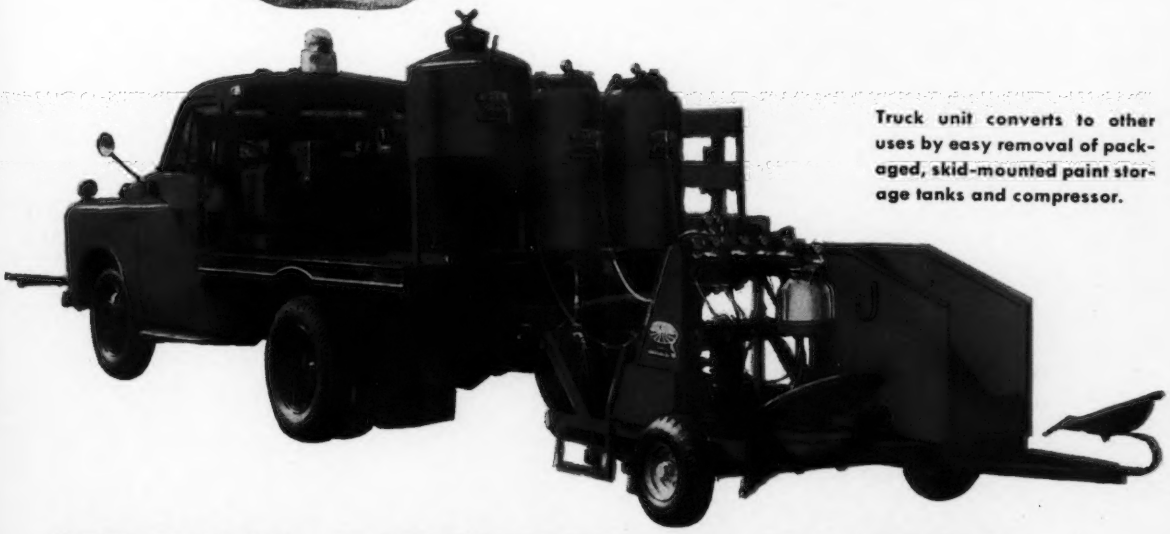
Wyoming's *Bob O'Connell* reports he is planning the installation of "buzzers" with the "Walk" "Don't Walk" pedestrian signals in downtown Cheyenne. Bob states these buzzers will be installed on all four corners of the intersection and will operate only during the initial six seconds of "Walk."

It is reported that considerable complaints have been received from pedestrians who step off the curb not realizing the signal reads "Don't-Walk." The buzzers should emphasize to pedestrians the initial period that they can leave the curb. The buzzers are loud enough to be heard at the intersection but not at the next inter-

(Continued on page 394)

Wow!

what a line! what a liner!



Truck unit converts to other uses by easy removal of packaged, skid-mounted paint storage tanks and compressor.

WALD TRUCK-O-LINER

Perfect stripes—mile after mile at speeds up to 12 MPH . . . single, double or triple, continuous or skip lines in one or more colors . . . the big production jobs really call for the WALD Truck-O-Liner, that delivers more miles of stripes in every man-hour day. Originally designed for open highway use, cities have been quick to adopt this unit because of its economy and ease of operation, and now constitute more than 50% of Truck-O-Liner customers.

If you've got a big striping program, this baby will bring it down to size!

Write for catalog W-56

WALD INDUSTRIES · INC. · HUNTINGDON, PA.

YEARBOOK CHANGES

BATES, Russell G. (Associate)
Traffic Engineer, D. Jackson Faustman, Sacramento. SEND MAIL: 21571 Royal Avenue, Hayward, California.

BRINKLEY, Douglas S. (Associate)
Planning Engineer, Department of Highways, District of Columbia. SEND MAIL: 10746 Kinloch Road, Silver Spring, Maryland.

BROWN, Philip S., Jr. (Junior)
Associate Highway Engineer, Washington Department of Highways, Planning Division. SEND MAIL: 313 East 20th Street, Olympia, Washington.

BRUENING, Martin E. (Member)
Traffic Engineer & Superintendent of Traffic Engineering & Electrical Services, 804 City Hall, Milwaukee 2, Wisconsin.

BURTON, Francis C. (Associate)
City Traffic Engineer, P. O. Box 1293, Albuquerque, New Mexico.

COYLE, Lewis R. (Associate)
Traffic Planning Engineer, Department of Traffic Engineering. SEND MAIL: 4 Somerset Road, Baltimore 28, Maryland.

DOWD, Allen J. (Junior)
Highway Engineer, Transportation Intelligence Agency, Washington, D.C. SEND MAIL: 745 South Florida Street, Apt. 3, Arlington, Virginia.

GALLAGHER, James A., Jr. (Associate)
District Traffic Engineer, Washington Department of Highways, Box 1717, Vancouver, Washington.

GENEST, Adrien (Member)
Traffic Engineer, Public Works Department, Room 600, Viger Building, 700 Craig Street East, Montreal 1, Quebec, Canada.

GERVAIS, Edward F. (Associate)
Engineer of Traffic Research, Traffic Engineering Research Section, Planning & Traffic Division, Michigan State Highway Department, 5th Floor, Stevens T. Mason Building, Lansing 26, Michigan.

GRIMM, Robert C. (Associate)
Traffic Engineer, East Orange Engineering Department. SEND MAIL: 21 Renshaw Avenue, East Orange, New Jersey.

KENNEDY, Norman (Associate)
Research Engineer & Assistant Director, Institute of Transportation & Traffic Engineering, University of California, Berkeley 4, California.

MANNING, John (Junior)
Assistant City Planner. SEND MAIL: 2113 South Geddes Street, Syracuse, New York.

McCANDLISS, Alfred N. (Member)
Safety Director, Headquarters Area Command, APO 403, New York, N. Y.

McGLASHON, Donald W. (Associate)
Traffic Engineer, Wilbur Smith & Associates, San Francisco. SEND MAIL: 3885 La Donna Street, Palo Alto, California.

McILRAITH, Evan J. (Member)
President & General Manager, West Town Bus Company, Oak Park. SEND MAIL: 1501 Hinman Avenue, Evanston, Illinois.

McREYNOLDS, M. B. (Associate)
Vice President & General Manager, Traffic Engineers Supply Corporation, P. O. Box 9193, Richmond 27, Virginia.

MENO, Fred J., II (Associate)
Electrical Engineer, Detroit Public Lighting Commission, 174 Atwater Street, Detroit 26, Michigan.

OAKES, Roy E. (Associate)
Acting Chief, Traffic Engineering Division. SEND MAIL: 3139 Eton Avenue, Berkeley 5, California.

OFFENBECHER, E. R. (Junior)
Civil Engineer, Holmes & Narver, Los Angeles. SEND MAIL: 9645 Saluda Street, Tujunga, California.

OLCOTT, Edward S. (Associate)
Executive Assistant to Director of Port Development, The Port of New York Authority, 111 Eighth Avenue, New York 11, New York.

OLIVER, Richard H. (Associate)
Senior Traffic Engineer, Maintenance Operations Division, Texas Highway Department, 11th & Brazos Streets, Austin, Texas.

RANKIN, Woodrow W. (Associate)
Director, Ottawa Department of Traffic Engineering Services, 48 Rideau Street, Ottawa, Ontario, Canada.

ROBBINS, Donald O. (Junior)
Assistant Traffic Engineer. SEND MAIL: 5428 Forbes Avenue, San Diego 20, California.

SCHEXNAYDER, Gerard E., Sr. (Junior)
Salesman, Quaid Insurance Agency, Gretna, Louisiana. SEND MAIL: 468 Manhattan Boulevard, Harvey, Louisiana.

SCHOPPERT, David W. (Junior)
Traffic Engineer, Automotive Safety Foundation, 200 Ring Building, Washington 6, D.C.

SHOCKEY, JACK W. (Junior)
Associate Traffic Engineer. SEND MAIL: 102 South Zenobia Street, Denver 19, Colorado.

THILLAINAYAGAM, R. (Associate)
Divisional Engineer (Highways) Krishnagiri, Salem District, India.

TODD, M. Mansfield (Member)
Associate Engineer, Wilbur Smith & Associates. SEND MAIL: 3031 Duncan Street, Columbia, South Carolina.

WEST, Melbourne H. (Associate)
Supervising Highway Engineer, California Division of Highways, P. O. Box 1499, Sacramento 7, California.

UNLIMITED OPPORTUNITY
in
TRAFFIC ENGINEERING

Graduate Engineers Are Needed By The
CITY OF LOS ANGELES
to develop new and original solutions to the vast traffic problems of the fastest-growing city in the nation.

Challenging Career Opportunities As

TRAFFIC ENGINEERING ASSISTANT
(No experience required)
$464 to $575

TRAFFIC ENGINEERING ASSOCIATE
(3 years' experience)
$545 to $677

Write TODAY for complete information.

City of Los Angeles
Engineering Recruitment Division
Room 5, City Hall
Los Angeles 12, California

GROWS AS YOUR TRAFFIC GROWS!

The most flexible – and economical – solution to future changes in traffic flow is the Crouse-Hinds Type LF Expansible Controller: A full flexible-progressive, variable time cycle traffic signal control that may be used with *any* existing *Trafflex* system.

The Type LF is supplied with 1, 2, or 3 jack-mounted dial-units. The *single timing motor* is attached to dial #1, and activates the other dial or dials through a simple, reliable system of gears. Any time cycle ranging from 40 to 120 seconds can be set manually or programmed automatically at the master controller. It instantly affects the dial-unit that is in use at the moment. Each dial-unit can be set for a different timing-split and a different offset.

All Type LF Controllers have provision for three dial-units regardless of the number of units originally purchased. They are available with 1, 2, or 3 resets on each dial-unit. When shipped from the factory, all controllers are wired for 3 resets. Resets 2 and 3 may be purchased originally or added at any time simply by installing dial contacts and switch arms.

Write today for full information on the Type LF Expansible Trafflex Controller . . . the Controller that "grows" with your Traffic control needs!

CROUSE-HINDS TYPE LF TRAFFLEX® EXPANSIBLE CONTROLLER

A NATIONWIDE DISTRIBUTION exclusively through ELECTRICAL DISTRIBUTORS

CROUSE-HINDS COMPANY

Main Office and Factory: Syracuse, N. Y.
Crouse-Hinds Company of Canada, Ltd.: Toronto, Ont.

OFFICES: Birmingham Boston Buffalo Chicago Cincinnati Cleveland Corpus Christi Dallas Denver Detroit Houston Indianapolis Kansas City Los Angeles Milwaukee New Orleans New York Philadelphia Pittsburgh Portland, Ore. St. Louis St. Paul San Francisco Seattle Tulsa Washington RESIDENT REPRESENTATIVES: Albany Atlanta Baltimore Baton Rouge Charlotte Chattanooga Jacksonville Reading, Pa. Richmond, Va. Shreveport

RESPECTED!

OBEYED!

SAFE-T-CONE*

*U.S. Pat. Number 2,719,505

ALL-RUBBER
TRAFFIC GUIDES

The silent workhorse of efficient traffic control!

NOW IN 3 SIZES! 12", 18", 28"

SPECIAL ADAPTERS increase uses!

- SIGNS
- FLASHERS
- FLAG ADAPTERS

PAINTED or REFLECTORIZED

Low cost, long life, lightweight make SAFE-T-CONES ideal for every traffic control need. Tough and strong, they're made to last, even with the most abusive use.

Write for complete descriptive folder.

FLASHER LIGHTS!

Uses standard 6-volt battery. Fits into top of all sizes. Unbreakable plastic lens.

2167

Made only by RADIATOR SPECIALTY CO., Charlotte, N. C.

STOP ACCIDENTS !!!

STOP accidents before they happen with Eastern Metal's traffic control signs SPEED LIMIT 30 MPH, ONE WAY, warning signs SLOW, R R and special highway safety equipment. MAXIMUM VISIBILITY for traffic engineering problems.

Eastern Metal
OF ELMIRA, INC.
140 Harrison St. Elmira Heights, N. Y.

MEMBERSHIP APPLICATIONS

APPLICATIONS FOR TRANSFER

KEESE, Charles J.
Associate Professor & Associate Research Engineer, Civil Engineering Department & Texas Transportation Institute, Texas A & M College, College Station, Texas. March 29, 1957 for MEMBER grade.

KIMLEY, Robert J.
Traffic Engineer, Traffic Engineering Division, City Hall, Greensboro, North Carolina. March 25, 1957 for ASSOCIATE grade.

MACNEE, Walter Q.
Traffic Engineer, Department of Highways of Ontario, Parliament Buildings, Toronto 2, Ontario, Canada. March 14, 1957 for MEMBER grade.

MENGILIBORU, Sedat
Director, Traffic Safety Department, General Directorate of Highways, Karayollari Umum Mudurlugu, Trafik Heyti Muduru, Ankara, Turkey. April 1, 1957 for MEMBER grade.

PERKINS, Hubert K., Jr.
City Traffic Engineer, Bureau of Traffic Engineering, 900 East Broad Street, Richmond, Virginia. April 3, 1957 for ASSOCIATE grade.

PERKINSON, Herbert R., Jr.
State Assistant Traffic & Planning Engineer, Virginia Department of Highways, 1221 East Broad Street, Richmond, Virginia. April 8, 1957 for MEMBER grade.

PHANEUF, Armand L.
Senior Civil Engineer, Massachusetts Department of Public Works, 100 Nashua Street, Boston, Massachusetts. March 8, 1957 for MEMBER grade.

NEW APPLICATIONS

ACTON, Alvin A.
Associate Traffic Engineer, St. Louis Traffic Division, Room 327, City Hall, St. Louis 9, Missouri. April 8, 1957 for JUNIOR grade.

COOK, Bernard L.
Junior Civil Engineer, Seattle Engineering Department, 323 Smith Tower, Seattle, Washington. March 4, 1957 for JUNIOR grade.

CUPP, Albert E.
Traffic Engineer 12, Traffic Signals, Traffic Control Department, Room 405, City Hall, Dallas, Texas. April 5, 1957 for ASSOCIATE grade.

DANE, Fred S.
Traffic Engineering Associate, Los Angeles Department of Traffic, Room 1000, City Hall, Los Angeles 12, California. March 6, 1957 for ASSOCIATE grade.

EVANS, Robert
Assistant Traffic Engineer, Bruce Campbell & Associates, Consultants, 177 Milk Street, Boston, Massachusetts. April 1, 1957 for JUNIOR grade.

FORSTER, John L.
Traffic Control Engineer, Department of Highways of Ontario, Parliament Buildings, Toronto 2, Ontario, Canada. March 5, 1957 for JUNIOR grade.

GALEOTA, Joseph M.
Principal Traffic Engineer, Boston Traffic Commission, 112 Southampton Street, Boston 18, Massachusetts. April 5, 1957 for MEMBER grade.

HARVEY, Alexander
Chief Project Engineer & Secretary Treasurer, DeLeuw, Cather & Company of Canada Limited, 52 Clair Avenue East, Toronto, Ontario, Canada. March 21, 1957 for ASSOCIATE grade.

IVEY, Joseph B.
Traffic Operations Engineer, Bureau of Traffic Engineering, Department of Public Safety, 900 East Broad Street, Richmond 19, Virginia. March 15, 1957 for JUNIOR grade.

JARVIS, Claude G.
Engineering Assistant, Texas Highway Department, P. O. Box 1286, Houston, Texas. March 22, 1957 for JUNIOR grade.

JOHNSON, Arnold A.
Assistant Traffic Engineer, 112 South 9th Street, Phoenix, Arizona. April 5, 1957 for JUNIOR grade.

MACURDY, Ernest H.
Senior Civil Engineer, Massachusetts Department of Public Works, Traffic Engineering Division, 100 Nashua Street, Boston, Massachusetts. April 1, 1957 for ASSOCIATE grade.

NOBLE, Charles M.
Secretary to the Governor (Director, Ohio Department of Highways), State Office Building, Front Street, Columbus, Ohio. April 5, 1957 for MEMBER grade.

OWENS, Terry J.
Urban Highway Engineer, Automotive Safety Foundation, 200 Ring Building, Washington 6, D.C. March 4, 1957 for MEMBER grade.

THOMPSON, James A.
Traffic Control Engineer, Missouri State Highway Department, Highway Building, Jefferson City, Missouri. March 20, 1957 for ASSOCIATE grade.

TIPTON, Jay W.
Senior Traffic Engineer, Department of Traffic Control, City Hall, Main & Harwood Streets, Dallas, Texas. April 1, 1957 for ASSOCIATE grade.

TWOMBLY, Bernard B.
Traffic Engineer, Massachusetts Department of Public Works, 100 Nashua Street, Boston, Massachusetts. March 14, 1957 for MEMBER grade.

VAZQUEZ RIVERA, Wilfredo
Civil Engineer III, Bureau of Traffic, Department of Public Works, Stop 22, Santurce, Puerto Rico. March 13, 1957 for JUNIOR grade.

WENGER, Deane M.
Junior Traffic Engineer, 274 City Courthouse, St. Paul, Minnesota. April 3, 1957 for JUNIOR grade.

NEW MEXICO proves OVERLAID FIR PLYWOOD SIGNS best by test

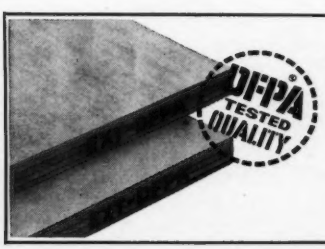
Plagued by vandals—who took an annual toll of over $25,000—and damage from severe weathering, the State of New Mexico Highway Department five years ago began a series of laboratory and field tests to develop signs which would effectively lower maintenance and replacement costs.

As a result, the department reports overlaid plywood the most durable of all sign materials. The state is now using it to replace steel and aluminum for signs in areas where vandalism had been prevalent. To date over 44,000 overlaid plywood signs have been placed in service. In all cases, they have lived up to expectations.

The Highway Department also cites superior paintability, ease of fabrication and elimination of framing or backing in larger signs as additional points in favor of overlaid plywood signs.

OVERLAID FIR PLYWOOD* GIVES YOU THESE ADVANTAGES

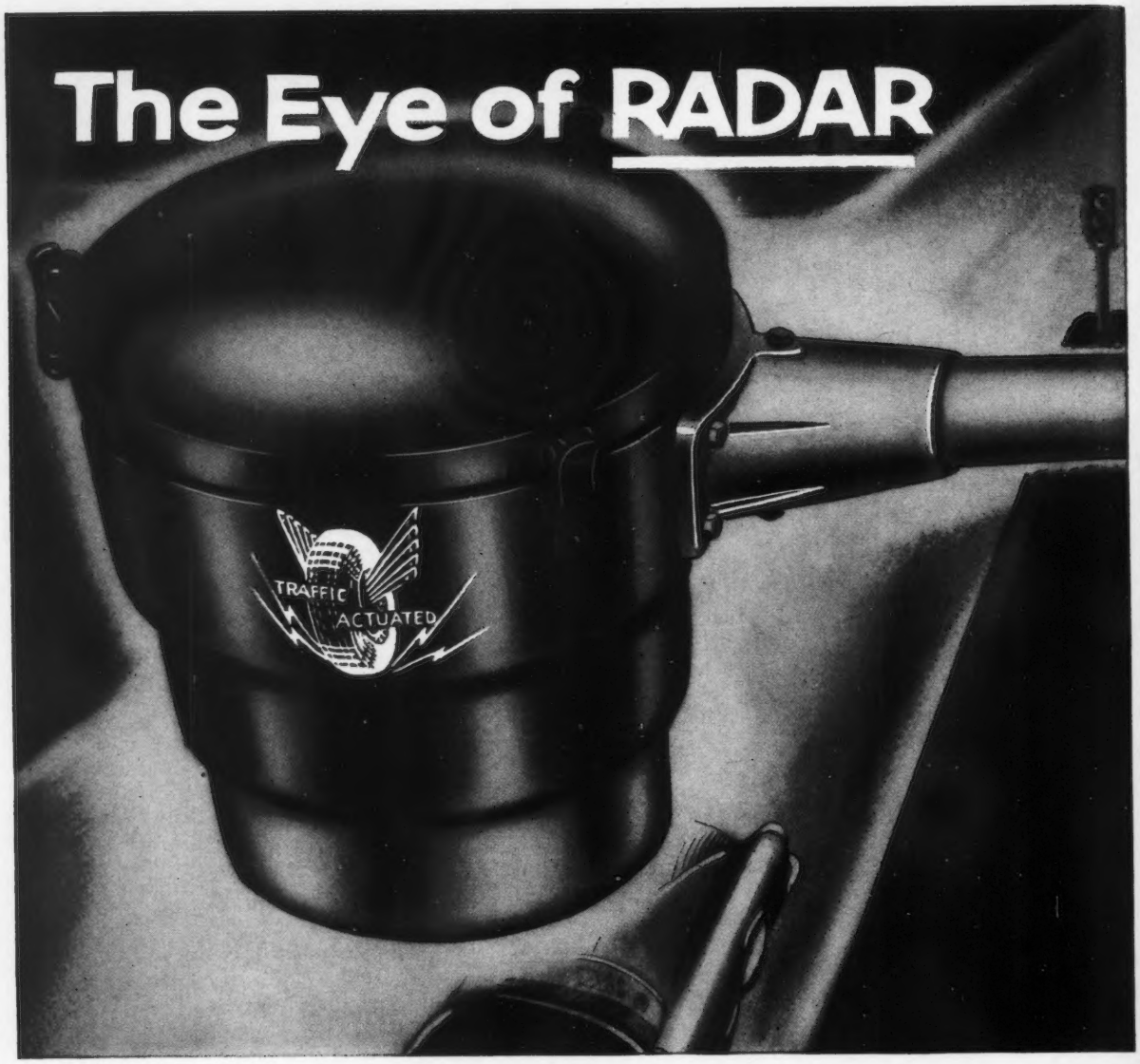
- Combines strength, rigidity and workability of plywood with smooth, durable, fused resin-fiber surfaces.
- Great resistance to severe weathering . . . accidents . . . gunshot, bending, other acts of vandalism. No progressive deterioration after damage. Cannot rust or corrode.
- Perfect for long-lasting paint or silk screen finishes. Reflective sheeting may be applied direct to high density overlay, eliminating prime coat.



*OVERLAID PLYWOOD is top-quality DFPA quality-tested Exterior fir plywood (EXT-DFPA®) with durable fused resin-fiber surfaces. Two types: (1) High density overlay is hard, glossy . . . need not be finished; (2) Medium density (paint grade) is smooth, opaque.

DOUGLAS FIR PLYWOOD ASSOCIATION
Tacoma 2, Washington, Dept. 161 (Good USA only)
Please send complete application-specification data on overlaid plywood for traffic signs.

Name .....
Firm or Dept. .....
Address .....
City ..... Zone ..... State .....



DETECTION FOR TRAFFIC CONTROL

in the modern manner . . .

The Electro-Matic® RADAR VEHICLE DETECTOR presents an entirely new concept in detection for traffic-actuated control. Situated *above* the street, the magic eye of radar operates continuously, unaffected by weather or climate. Completely electronic, it is dependable, accurate, and versatile. With no need for pavement excavation, the Model RD-1 Detector is readily moved or adjusted to roadway changes. It's easily installed on bridges, or wherever installation of regular detectors previously had been difficult.

There *are* many locations where nothing else can do the job as well, or as economically as the RD-1. Write for the copy of the new Radar Detector Bulletin D-154 for details.

AUTOMATIC SIGNAL DIVISION

EASTERN INDUSTRIES, INCORPORATED

NORWALK • CONNECTICUT

Reference Notes

USE OF CITY STREETS, ALLEYS, AND SIDEWALKS BY BUILDING CONTRACTORS

By George J. Fisher
(Mem., ITE)
Director of Service, Wichita, Kansas

Edited by Norman C. Barnett
(Assoc. Mem., ITE)
Palmer and Baker, Inc., New Orleans

The City of Wichita, Kansas, recently sent questionnaires to 56 cities over 170,000 population to find out what their policy or code was in dealing with the amount of street, alley, and sidewalk area allowed building contractors.

Streets. Thirty-nine cities reported five major methods of measuring the street area allowed contractors. Each method had several variations. Table 1 indicates the methods found. Some cities reported two methods.

Baltimore, Maryland, is the only city that does not allow a building contractor any use of a public street. Philadelphia, Pennsylvania, does not allow any building material to be stored on the streets in the central business district.

Of the 39 cities, ten stated that approval of traffic authorities is needed or sought in granting of permits to contractors. In six of these cities, traffic officials have the authority to deny a permit to be granted.

Alleys. The maximum amount of alley space allowed building contractors shows more variation than in those measurements applied either to street or sidewalk area. Table II indicates the methods reported. All cities did not reply to this question. Two cities reported no alleys.

Fees Charged for Permits. Twenty-seven cities call for costs to be met on the part of the contractor before a permit is granted allowing him use of a street, alley, or sidewalk in his operations. The type of fee levied falls into five broad classifications, but the actual amount paid by contractors in the 27 cities can be said to have 27 variations. The fee classifications were: flat fee (10 cities), based on location (7 cities), deposit by contractor (4 cities), surety bond by contractor or building owner (4 cities), and rate increases based on duration of use (2 cities).

Nine cities charge contractors a flat fee for the use of public space, five cities base their fee upon the number of feet being used by the contractor, and the other four charge a fee for the permit granted.

A contractor in the District of Columbia obtains a permit costing $2.00 for each separate installation, such as storage of materials, erection of fence. etc. The other cities that only charge permit costs require a renewal of the

TABLE 1
SPACE ALLOWED BUILDING CONTRACTORS IN STREET

Area Allowed Contractor		Cities Using Method
I	Roadway Area	
	1. One-fourth of roadway	2
	2. One-half of roadway	1
	3. One-third of roadway	13
		16
II	Traffic Lanes	
	1. One-half of traffic lane	1
	2. One traffic lane	2
		3
III	Feet from curb	
	1. Six feet	1
	2. Seven feet	4
	3. Eight feet	7
		12
IV	Property Lines	
	1. One-fourth area between	1
	2. One-third area between	1
		2
V	City Discretion or No Space	
	1. City determines each case	7
	2. No street space	1
		8

TABLE 2
SPACE ALLOWED BUILDING CONTRACTORS IN ALLEYS

Area Allowed Contractor:		Cities Using Method
I	Footage limitation	
	1. One-fourth of alley	1
	2. One-half of alley	4
	3. Only that in excess of ten feet	3
II	Entire alley	6
III	City discretion or no space	
	1. Discretion of city	7
	2. Continuance of traffic primary importance	6
	3. No alley space	1
IV	No control of alleys	3

Sidewalks. Most of the cities (23) allow use of the entire sidewalk area. This is shown in Table III. All cities did not reply to this question.

TABLE 3
SPACE ALLOWED BUILDING CONTRACTORS IN SIDEWALKS

Area Allowed Contractor		Cities Using Method
I	Entire sidewalk	23
II	Portion of Sidewalk	
	1. Four feet	1
	2. Five feet	3
	3. One-half	3
	4. Two-thirds	1
	5. Discretion of city	3

permit after a specified period of time. Scranton, Pennsylvania, requires that the permit be renewed after 30 days; Los Angeles, California, after 60 days; and Minneapolis, Minnesota, after 90 days.

In seven cities, higher fees are charged in the downtown or business district, with a lesser fee in the other parts of the city. Fort Worth, Texas, New Orleans, Louisiana, and Tulsa, Oklahoma, also levy a charge for blocked parking meter spaces. In Boston, Massachusetts, a contractor is charged ten cents per square foot per month in the city proper, while in other sections of the city, the charge is five cents per square foot per month.

Cincinnati, Ohio, divides itself into two districts. District A is the congested area, and District B is that area which does not fall in District A. The minimum fee for storage of material on the sidewalk in District A is $25.00, while in District B the minimum fee is $4.00. For public space other than sidewalks in District A, Cincinnati charges a minimum of $35.00; in District B the minimum charge is $12.00.

Philadelphia, Pennsylvania, does not allow building material to be stored on the streets in the central business district. Outside of this district, material may be stored on the streets. The minimum fee for such storage is $10.00 for paved streets and $5.00 for unpaved streets.

SECTION NEWS

(Continued from page 386)

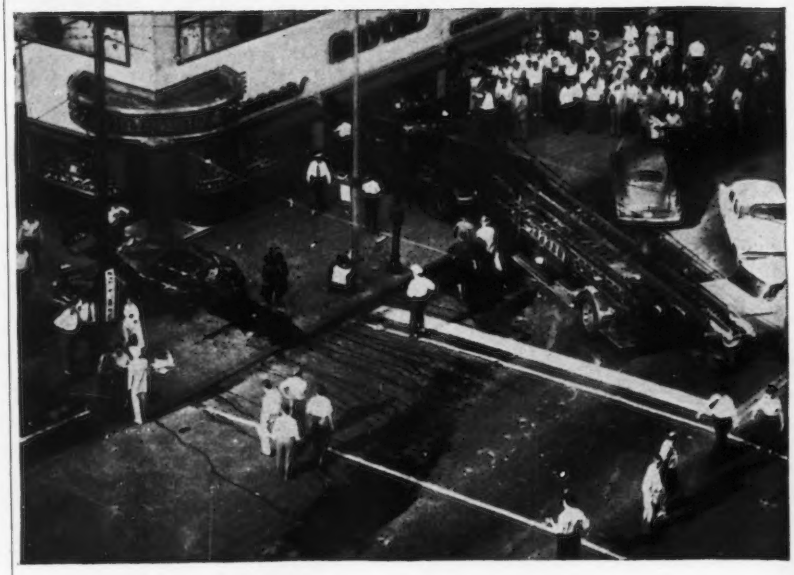
section 300 feet away, nor will they interfere with apartment houses, etc., that are located near the intersection.

Idaho's *Lewis J. Ross,* Chief Design Engineer, Idaho Department of Highways, reports that Idaho is becoming more and more conscious of the advantages of one-way street operation. The Highway Department has been instrumental in establishing one-way couplets in Lewiston and Pocatello; and it appears that Twin Falls may be next. Also, Boise and Idaho Falls are seriously considering a one-way grid in their downtown sections to aid in solving traffic congestion. Lew states this plan has the blessing of the Boise Chamber of Commerce.

James W. Challis, City Traffic Engineer, reports that Salt Lake City is in the process of installing Winko-Matic pedestrian "Walk" "Don't Walk" signals in the downtown business district.

The new signals show "Walk" in green and "Don't Walk" in red and are 5½" letters. They are to be located at four intersections on Main Street.

Eliminate This!



with **EL-TEC**

RADIO TRAFFIC CONTROLLERS

Crashes like this Cost Lives ... Property ... Money ... and tie-up badly needed equipment and highly trained personnel. *These tragedies virtually can be eliminated!*

The driver of an emergency vehicle can have uncontested, clear right-of-way for blocks ahead ... he can stop all traffic on his route. He does it with EL-TEC, an electronics system for controlling traffic from a moving emergency vehicle.

EL-TEC is new, but years of research and development have proved its dependability. The system and equipment have been hailed as the most important stride in emergency traffic safety in many years.

EL-TEC has been commended by the nation's leading police, fire and traffic officials as well as various State Safety Committees and Highway Commissions.

Electronic Protection Inc.

Subsidiary of Standard Coil Products Co. Inc.

2083 North Hawthorne Avenue - Melrose Park, Illinois

The Only FCC Approved System For Emergency Traffic Control

6401

GET THE FACTS!
SEND COUPON TODAY!

You owe it to yourself, your community, your firemen, policemen and all emergency drivers to learn how low-cost, reliable EL-TEC Radio Traffic Controllers can save lives, prevent suffering, cut down property damage, keep all emergency equipment "in service."

ELECTRONIC PROTECTION INC.
Subsidiary of Standard Coil Products Co. Inc.
2083 North Hawthorne Avenue, Melrose Park, Illinois.

☐ Please have representative call.
☐ Please send literature on EL-TEC.

Name_____

Title_____

Address_____

City_____ State_____

Washington News

The Washington Planning Division has again found itself deeply embroiled in the controversy over the location for the Second Lake Washington Bridge. Since their original studies and recommendations made in 1949 this bridge has been a continuing problem. The Toll Bridge Authority utilized the Planning Division in studying proposed toll facilities and such projects are generally the subject of much public interest and controversy. As for many other projects the Lake Washington traffic desires and needs are contrary to the wishes of some very outspoken local groups who, logically enough, are traffic experts also! Thus far *Squeeg Glaze* has been able to convince the Legislature of the correctness of the Planning Division recommendations but the City of Seattle has taken a stand against the location proposed.

YALE STUDENT CHAPTER

Lester L. Kolom, Secretary

In a spirited contest, the outcome of which was delayed for a week because of a voting stalemate, the Yale student chapter elected the following class officers for the second term of the school year: *Anthony J. Galioto,* President; *Desmond J. Delaney,* Vice President; *Lester L. Kolom,* Secretary, and *Walter Kudlick,* Treasurer.

With the weightier matters thus settled, i.e., (who are the chiefs and who the indians), the group held a combined social-technical meeting on Wednesday night, February 13, 1957 in the taproom of the Hull brewery. Although there was a discussion period concerned with thesis results and also a talk on the psychology of job seeking, the most impressive learning to transpire that evening was the fact that American breweries give away free beer as an advertising and good will gesture. (This impressed our twelve students who are foreign nationals and also stimulated an experiment on the part of those present to determine their possible, basic and practical capacities for free beer. Our conclusion was that more research in this vital field is necessary.)

Letters to the Editor

More on Interstate Signing

Dear Sir:

I should like to comment on two items in Mr. Robert Conradt's letter published in the March 1957 issue of TRAFFIC ENGINEERING.

The use of route letters for the Interstate System, which he proposes, presents difficulties in states where route letters are already in use. In Wisconsin and Missouri county state-aid highways on the federal aid sec-

(Continued on page 398)

*Guaranteed PERMA-LINE is *safely* on the job, every day of the year, because PERMA-LINE outlasts old-fashioned paint 6 to 8 times.

Highly paid maintenance crews, once confined to heavily-travelled downtown intersections, can now cope with the increasing control and safety problem of newly developed suburbs. You get more coverage, *year 'round coverage,* because PERMA-LINE virtually multiplies your present working force.

RESULT: Economical safety markings you can count on for full-time efficiency and protection.

PERMA-LINE ends traffic snarls because it is quickly and easily applied, sustains full traffic impact almost immediately, actually becomes part of the pavement surface.

perma-line

VEON CHEMICAL CORPORATION • 22-09 BRIDGE PLAZA NORTH • LONG ISLAND CITY 1, N.Y.

For free illustrated brochure and the name of your nearest distributor fill in this coupon.

NAME _____ TITLE _____

ADDRESS _____

CITY _____ STATE _____

Professional Service Directory

DE LEUW, CATHER & COMPANY
CONSULTING ENGINEERS

Public Transit — Subways
Traffic & Parking — Railroad Facilities
Expressways — Industrial Plants
Grade Separations — Municipal Works
Urban Renewal — Port Development

150 North Wacker Drive, Chicago 6
San Francisco Toronto Oklahoma City

TRAFFIC ENGINEERING **HIGHWAY PLANNING**

BRUCE CAMPBELL & ASSOCIATES
ENGINEERS

177 MILK STREET • BOSTON 9

PARKING **AIRPORTS** **SHOPPING CENTERS**

ALFRED KAEHRLE ASSOCIATES
CONSULTING ENGINEERS

Highway Planning — Highway Design
Traffic Engineering Surveys
Parking Studies — Shopping Centers

10 North Main Street
West Hartford 7 Connecticut

YOUR CARD
could be set in this space at a very reasonable rate.

•

If interested, please write
TRAFFIC ENGINEERING • 2029 K Street NW • Washington 6, D.C.

Positions Available

ALLEGHENY COUNTY PLANNING COMMISSION

Position: Traffic Engineer.
Requirements: Civil engineering degree plus graduate work in traffic engineering, together with experience in the field of traffic engineering.
Salary: Open, depending upon qualifications.
Apply: Send brief resumé of education and experience, with names of three references, to John J. Mathews, Executive Director, Allegheny County Planning Commission, 416 County Office Building, Pittsburgh 19, Pennsylvania.

LONG BEACH, CALIFORNIA

Position: Assistant Traffic Engineer.
Requirements: Graduate Civil or Electrical Engineer. Age 24 through 50. Three years of professional traffic engineering experience. Graduate schooling in Traffic Engineering equal to one year of experience.
Salary: $6444 to $7908. Open. Annual increases after probationary period. Retirement and Social Security benefits.
Appointment: On basis of experience, education and references. Immediate employment desirable.
Apply: Robert D. Dier, City Traffic Engineer, City Hall, Long Beach, California.

MADISON, WISCONSIN

Position: Assistant Traffic Engineer.
Qualifications: Registered professional engineer to act as assistant traffic engineer in newly established department.
Salary: $622 to $691 per month.
Apply: Personnel Department, City Hall, Madison 3, Wisconsin.

INDEX TO ADVERTISERS

A'G'A Division of Elastic Stop Nut Corporation 375
Automatic Signal Division of Eastern Industries, Inc. 392
Cataphote Corporation 350
Crouse-Hinds Company 389
Douglas Fir Plywood Association 391
Duncan Parking Meter Corporation 399
Eagle Signal Corporation 385
Eastern Metal of Elmira, Incorporated 390
Electronic Protection Incorporated 394
Electronic Signal Company, Incorporated 377
Flex-O-Lite Manufacturing Corporation 354
Graduate Engineers Wanted 388
Kaiser Aluminum 373
J. W. Neff Laboratories, Incorporated 356
Magee-Hale Park-O-Meter Company 352
Minnesota Mining & Manufacturing Co. 379
Pfaff and Kendall 351
Prismo Safety Corporation ..... Back Cover
Radiator Specialty Company 390
Traffic and Street Sign Company 383
Traffic Engineer Wanted 372
Union Metal Manufacturing Company 381
Veon Chemical Corporation 395
Wald Industries Incorporated 387

Professional Service Directory

EDWARDS, KELCEY and BECK
CONSULTING ENGINEERS

Surveys — Reports — Economic Studies — Design — Supervision
Transportation — Traffic — Parking — Terminals — Port and Harbor Works
Highways — Expressways — Grade Separations — Tunnels
Bridges — Water Supply — Management

3 William Street, Newark 2, N. J. • 250 Park Avenue, New York 17, N. Y.

PARSONS, BRINCKERHOFF HALL & MACDONALD
Engineers

Bridges, Highways, Tunnels, Airports, Subways, Harbor Works, Dams, Canals, Traffic, Parking and Transportation Reports, Power, Industrial Buildings, Housing, Sewerage and Water Supply.

51 Broadway New York 6, N. Y.

THE H. K. FERGUSON COMPANY
ENGINEERS AND BUILDERS
PARKING AND TRAFFIC SURVEYS • ECONOMIC STUDIES
GARAGE DESIGN AND CONSTRUCTION

New York - Cleveland - Cincinnati - Chicago - Atlanta
Los Angeles - San Francisco - Toronto - London

HARDESTY & HANOVER
CONSULTING ENGINEERS
BRIDGES — Long Spans of All Types
Movable — Lift, Bascule & Swing
Hanover Skew Bascule
Grade Crossing Eliminations
Other Structures Foundations
Expressways and Thruways
Design — Supervision — Inspection
Valuation — Reports
101 Park Avenue New York 17, N. Y.

PALMER AND BAKER, INC.
CONSULTING ENGINEERS — ARCHITECTS
Surveys — Reports — Design — Supervision — Consultation
Transportation and Traffic Problems Tunnels Bridges Highways Airports
Industrial Buildings Waterfront and Harbor Structures
Graving and Floating Dry Docks
Complete Soils, Materials and Chemical Laboratories
Mobile, Ala. New Orleans, La. Harvey, La.

S. Herbert Taylor Frank J. Sleeper
David L. Taylor William H. Taylor
SHERMAN, TAYLOR & SLEEPER
CONSULTING ENGINEERS
501 Cooper Street, Camden 2, N. J.
EMerson 5-0555
Park & Norwod Aves., Pennsauken 8, N. J.
MErchantville 8-4848

GANNETT FLEMING CORDDRY and CARPENTER, INC.
---ENGINEERS---
CONSULTING SERVICE FOR TRAFFIC, PARKING and TRANSPORTATION PROBLEMS
City Planning — Highways — Bridges — Flood Control
Water Supply — Sewerage— Industrial Waste — Garbage Disposal
Appraisals — Investigations — Management
600 NO. 2nd STREET HARRISBURG, PA.
Pittsburgh, Pa. Philadelphia, Pa. Daytona Beach, Fla. Medellin, Colombia, S. A.

JENKINS, MERCHANT & NANKIVIL
Consulting Engineers
Municipal Improvements Sewerage
Power Development Water Systems
Traffic Surveys Industrial Plants
Flood Control Recreational Facilities
Airports Investigations and Reports
805 East Miller Street
Springfield, Illinois

TRANSPORTATION PROBLEMS
HIGHWAYS
THE CLARKESON ENGINEERING COMPANY
INCORPORATED
285 Columbus Ave., Boston 16, Mass.
COmmonwealth 6-7720
EXPRESSWAYS AIRPORTS

Highway Traffic Engineers, Inc.
345 Boylston Street
Brookline 46, Massachusetts
LOngwood 6-0275

TIPPETTS — ABBETT McCARTHY — STRATTON
Engineers
Traffic, Parking and Transportation
Surveys, Economic Studies and Financial Reports
Highways, Subways, Bridges, Tunnels—Airports, Ports, Harbors, Power Developments, Water Supply, Sewerage
Planning, Reports, Design, Supervision of Construction
62 West 47th St. 110 Market St.
New York 36, N.Y. San Francisco, Cal.

LETTERS

(Continued from page 395)

ondary system are marked with route letters such as M, AA, XQ, etc. and the routes are as well-signed as most federal aid primary routes. Other states use letters as suffixes to route numbers, such as Washington's 9E, 3H, 1R, etc.

Secondly, the Interstate System does not always follow existing U. S. route designations. In Texas, for example, the Interstate Route between San Antonio and El Paso follows State Highway 27, a federal aid primary route, between Comfort and the junction with U. S. 290 southeast of the City of Junction.

Yours very truly,
W. R. STEBBINS, JR.

Evanston, Illinois
March 19, 1957

Sir:

It is with much interest that I have read the letter to you in the last edition of TRAFFIC ENGINEERING by Mr. Robert Conradt of the New Mexico State Highway Department which discussed a distinctive route marker for the Interstate System.

I agree with many points of his discussion. I am whole-heartedly in agreement that any distinctive system should employ the use of the alphabet rather than numbers. Twenty-six letters are not sufficient, therefore, it would be necessary to use two letters and it is my thought that two-letter pronounceable words such as "AL," "AN," "ED," "FE," "FI," etc. should be used.

I also agree with Mr. Conradt that the use of one of our limited number of colors should not be usurped by assigning it to the Interstate route marker. Practically all good usable colors are now assigned for a certain type of sign. However, there are many combinations of colors which are not now used and could be used for this purpose.

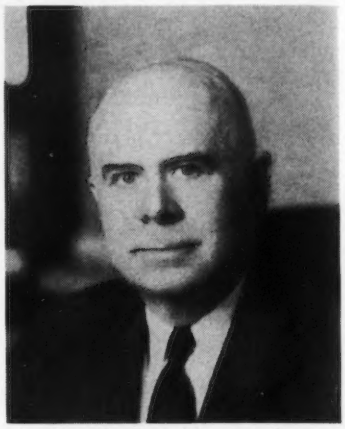
His letter proposed a system but in his conclusions and recommendations he recommended that no new shape or color be used but, instead, use the US shield with an "I" prefix. By doing this it would be necessary to transfer to the Interstate System other route numbers now assigned to existing roads. This, to me, is the real urgency for the third numbering system. It is felt that our State is like a majority of others except a few of the sparsely populated midwestern states in that the Interstate System for almost its entire distance will be built on new location. As an example of what transferring existing route numbers means in our State, there is a short section 60 miles in length where it will be necessary for the driver to follow five different numbered routes in order to stay on the Interstate System.

Those who have expressed opposition to a third system of designation seem to have ignored the principal factor which makes it desirable, and that is the problems of Highway administrators as well as operating employees doing the signing when they have to confront insistent pressure from merchants, Chambers of Commerce and municipalities in their pleas not to take the existing route from their main street and thereby put them out of business.

ROBERT A. BURCH
Traffic Engineer
N. C. State Highway & Public Works Commission

Raleigh, N. C.
April 9, 1957

Thomas H. MacDonald



Thomas H. MacDonald (Honorary Member, ITE) died April 7 in College Station, Texas, at the age of 76.

Mr. MacDonald had retired in 1953 from the Bureau of Public Roads after serving as Chief and then Commissioner for 34 years. At the time of his retirement he had held his post longer than any other official had headed a major Federal agency. Since 1953 he had held the title of Distinguished Research Engineer, Texas A&M College, College Station, Texas.

Born in Leadville, Colorado in 1881, Mr. MacDonald was educated in Iowa and received his bachelor's degree in civil engineering from Iowa State College in 1904. He was later honored by doctor's degrees from Iowa State and from Brooklyn Polytechnic Institute.

He began his engineering career with the Chicago Great Western Railroad, but soon thereafter joined the Iowa State Highway Department, where he was Chief Engineer until 1919 when he became Chief of the Bureau of Public Roads.

In 1946 he was awarded the Medal of Merit by President Truman for his leadership in building and maintaining strategic highways needed during the war. In 1948 he was selected by the Society of Automotive Engineers as the David Beecroft Memorial Lecturer for his contributions to traffic safety.

Mr. MacDonald early recognized the importance of the traffic engineering approach. In 1922 he launched the first state-wide study of traffic in cooperation with the State of Connecticut. This was followed by transportation surveys in New Hampshire, Vermont, Pennsylvania, Cook County (Illinois), the Cleveland metropolitan area, and eleven western states. In 1935 he launched the comprehensive planning surveys participated in by all states.

Under his direction, the Bureau of Public Roads undertook numerous research projects dealing with vehicle movement and highway safety. He advanced the theory that it would be better to design highways to fit the kind of drivers actually operating vehicles than to attempt to re-make drivers to fit some engineering ideal of highway design. This concept, which has been generally accepted now, was for many people a new viewpoint when he advanced it.

Mr. MacDonald, who died suddenly and apparently from a heart attack, is survived by his wife, the former Caroline Fuller; a daughter, of Staunton, Virginia; and a son, of Washington, D. C.

DUNCAN-MILLER "60"
®

GOOD-WILL TOKENS . . .

Provide the opportunity for generating customer good-will through the co-operative efforts of your city and its retail merchants' association.

BUSINESS ASSET . . .

Aggressive promotion of off-street parking facilities through use of good-will tokens materially assist in maintaining customer patronage. Surveys indicate that average purchases made by an off-street parker greatly exceed those made by curb parking customers.

LOW COST . . .

Only Duncan-Miller meters incorporate and offer these bonus advantages to your municipality at *No Extra Cost.*

DUNCAN

DUNCAN PARKING METER CORP.
835 NORTH WOOD STREET, CHICAGO 22, ILLINOIS
FACTORIES: HARRISON, ARKANSAS AND MONTREAL, P.Q., CANADA
Manufacturers of fully automatic and manual parking meters.

The only striping that outlasts *PLASTIX!*

You can be sure of 24-hour, all-weather life saving protection with durable Prismo Plastix. Sharp reflectivity clearly designates dangerous intersections, school zones, cross-walks and all other vital spots, makes your city's streets models of safety.

Nothing gives a street that "marked for life" look like Prismo Plastix. It's been proven the most indestructible of all reflective materials for marking streets. Though pavements take the toughest kind of beatings from heavy traffic, Prismo Plastix "stays put" brilliantly, its high reflective powers stronger than ever.

This finished Prismo product has 3 outstanding features: DURABILITY, VERSATILITY and ECONOMY. Goes on fast (no traffic interruption), has a hundred-and-one efficient uses, has incredibly long life (up to 6 years in many cases).

In addition, Prismo Plastix has *Exclusive Self-Sealing* and *Re-Sealing* Action. Adhesive is needed for the initial tack *only* . . . This wonderful material *integrates itself* into the pavement and *reseals itself* with sun and traffic. Prismo Plastix is the Methuselah of street markings!

PRISMO SAFETY CORPORATION

HUNTINGDON, PENNSYLVANIA